

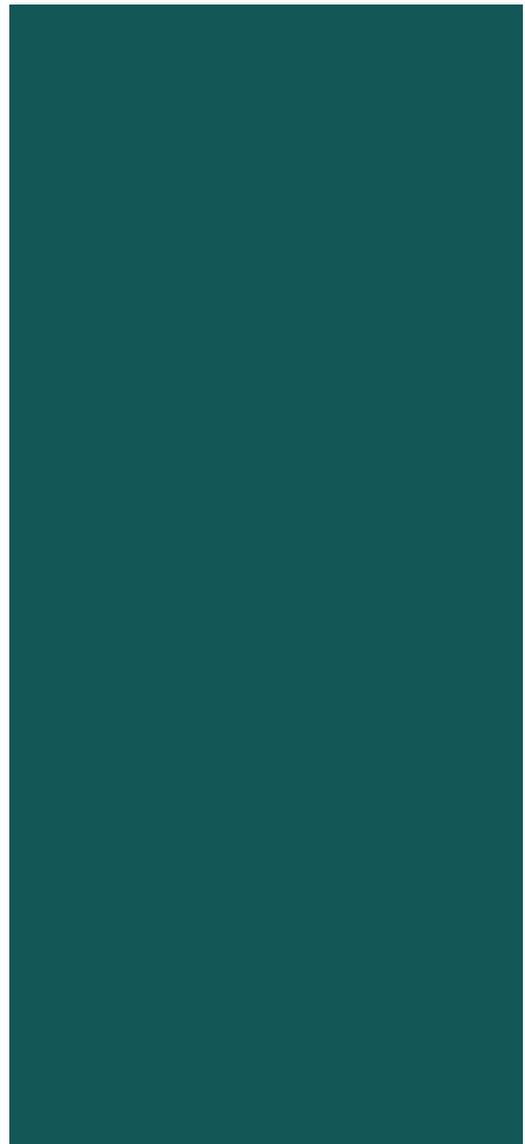


PlanBTV Transportation Study

Final Report

October 2011

DATA ■ ANALYSIS ■ SOLUTIONS



Report Prepared by:



60 Lake Street, Unit 1E • Burlington, Vermont 05401
TEL 802.383.0118 • FAX 802.383.0122 • www.reginc.com



Report Prepared for:

The City of Burlington, VT Planning & Zoning Department

Disclaimer:

The work that provided the basis for this publication was supported by funding under an award with the U.S. Department of Housing and Urban Development. The substance and findings of the work are dedicated to the public. The author and publisher are solely responsible for the accuracy of the statements and interpretations contained in this publication. Such interpretations do not necessarily reflect the views of the Government.

TABLE OF CONTENTS

| | |
|--|-----------|
| EXECUTIVE SUMMARY | 1 |
| 1.1 Synthesis of Prior Plans and Studies | 2 |
| 1.2 Circulation | 4 |
| 1.3 Parking | 8 |
| 1.4 Parking Ordinance and Policy Review | 13 |
| 1.5 Parking & Transportation Issues and Opportunities | 14 |
| 1.6 Recommendations | 16 |
| 1.0 INTRODUCTION | 1 |
| 1.1 PlanBTV Goals/Desired Planning Outcomes | 1 |
| 1.2 PlanBTV Transportation Study | 2 |
| 2.0 PRIOR PLANS AND STUDIES | 3 |
| 2.1 City-wide Themes..... | 3 |
| 2.2 Plans Specific to the PlanBTV Study Area | 5 |
| 2.3 Status of Projects Identified in the Reviewed Documents..... | 11 |
| 3.0 CIRCULATION..... | 12 |
| 3.1 Existing Circulation..... | 12 |
| 3.2 Future Circulation | 18 |
| 4.0 PARKING | 21 |
| 4.1 User Groups | 22 |
| 4.2 Existing Parking Conditions | 23 |
| 4.3 Future Parking Conditions..... | 35 |
| 5.0 PARKING ORDINANCE AND POLICY REVIEW | 37 |
| 5.1 Defining Parking Problems..... | 39 |
| 5.2 Determining Optimal Parking Supply..... | 40 |
| 5.3 Parking Facility Costs..... | 40 |
| 5.4 Current Ordinance | 41 |
| 5.5 Parking Management Strategies..... | 47 |
| 5.6 Ordinance Review Conclusions | 49 |
| 6.0 PARKING & TRANSPORTATION ISSUES AND OPPORTUNITIES | 49 |
| 6.1 Parking | 49 |
| 6.2 Circulation and Connectivity | 50 |
| 6.3 Land Use..... | 51 |
| 7.0 RECOMMENDATIONS | 51 |
| 7.1 Regulatory Recommendations..... | 51 |
| 7.2 Organizational Recommendations..... | 54 |

7.3 Infrastructure Recommendations57



EXECUTIVE SUMMARY

In the fall of 2010, Burlington's Planning and Zoning Department received a Sustainable Communities Challenge Planning Grant from the US Department of Housing and Urban Development providing a unique opportunity to invest in the future and advance Burlington's place as one of America's most livable and sustainable communities. Burlington struggles to address complex urban challenges in a small, under-resourced New England community with big ideas and even bigger ideals.

This planning grant makes possible PlanBTV—a new comprehensive land use and development master plan for Burlington's Downtown and Waterfront— which will refine broad city-wide goals for sustainable development into focused, actionable, area-specific strategies to ensure the vitality of the central core of our community and enable us to achieve our community vision. The intent is to identify, understand, and address current barriers to the creation of new infill development.



PlanBTV Goals/Desired Planning Outcomes

PlanBTV will provide recommendations, tools, and strategies that will help achieve the following goals and outcomes:

- Maintain Burlington as a regional population and economic center that offers meaningful jobs at livable wages and a diverse housing stock that serves all incomes, while encouraging the continued growth of the city's commercial the tax base.
- Promote urban development measures that facilitate economically competitive, environmentally sound, socially responsible, and aesthetically-pleasing land-use combinations and urban design elements.
- Emphasize the importance of preserving historic and cultural features and architecture, and encouraging high-quality building design to complement the existing fabric.
- Strengthen the linkages between the Downtown, Downtown Waterfront, and surrounding neighborhoods, including the Hill institutions (University of Vermont, Champlain College, and Fletcher Allen Health Care).
- Promote a mix of land uses including the need for affordable/workforce housing, both local and world class businesses, entertainment and culture, live/work spaces, etc.
- Provide a focused sustainable transportation and accessibility system within the context of the existing street network and emphasizing alternatives to the single occupancy vehicle (SOV). This should build upon the Complete Streets system and Street Design Guidelines already included in the adopted Citywide Transportation Plan.
- Provide a comprehensive parking allocation and management system that meets visitor, business, and resident needs consistent with the goal of increasing public transit and reducing dependence on the single-passenger automobile.
- Provide the quality and capacity of public infrastructure, including pedestrian, bicycle, parking, and/or transit-related facilities, necessary to support new or expanded commercial and residential development.
- Strengthen Burlington's leadership position in clean energy and climate action planning by enabling broad-based community participation in the identification, quantification, visualization, and decision-making related to the energy and greenhouse gas impacts.
- Provide the foundation for the development of a code for the Downtown and Downtown Waterfront to guide and regulate future development in a coherent and consistent manner centered on urban form, design, and performance.

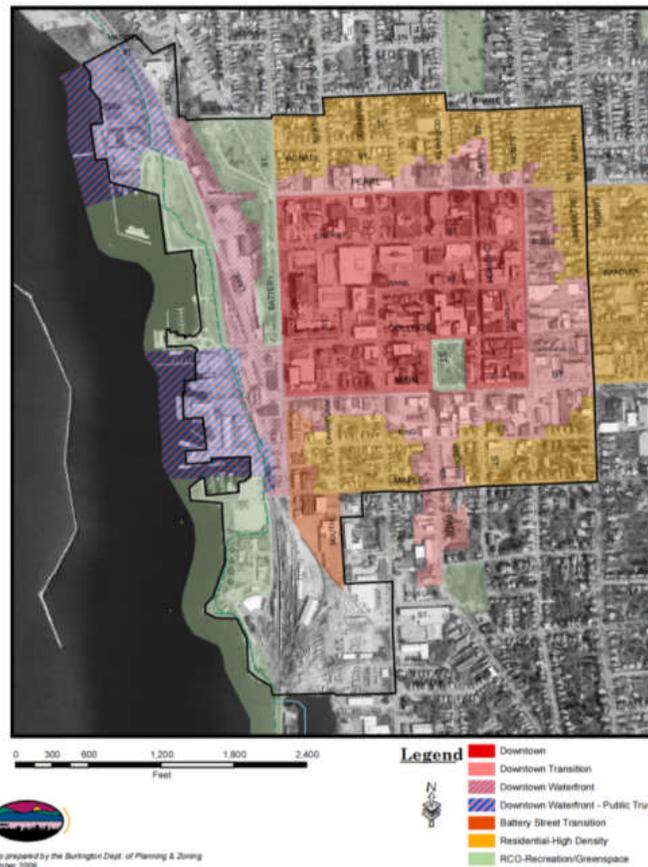
PlanBTV Transportation Study

The central goal of PlanBTV is to identify, understand, and address current barriers to new infill development. This Transportation Study for PlanBTV provides important information, perspective, analysis and recommendations that will be used to inform the planning process with regard to parking and circulation, and includes the following elements:

- Synthesis of Prior Plans and Studies
- Existing and Future Circulation
- Existing and Future Parking
- Parking Ordinance and Policy Review
- Involvement and Participation of Local Planning and Development Stakeholders
- Recommendations for Overcoming Transportation and Parking Barriers to Infill Development

The study area is shown in Figure 1. Rather than serve as a stand-alone plan, this report and the information, analysis, and recommendations provided in it are intended to inform the upcoming master planning and code development phases of PlanBTV.

Figure 1: Study Area and Land Use Zoning



1.1 Synthesis of Prior Plans and Studies

The Synthesis of Previous Plans and Studies reviews documents which have brought Burlington to its current state and established the future vision for the City. Major themes from these plans include the need to **develop a seamless transportation system that provides high bicycle and pedestrian connectivity and convenient, reliable, and comfortable transit**. Other major take-aways from these documents are **improving access to parking**; that is, improving parking efficiency, traffic circulation, and the users' experience (and consequently economic vitality); and the need for improved **parking management**, such as wayfinding improvements and implementation of 'smart signs' that convey real-time parking information. Another common recommendation is for the development of a **multimodal transportation center**. CCTA identifies this as its "most needed facility investment" in its 2010 Transit Development Plan. A multimodal transportation center is critical in advancing improvements in the overall system. Expanding transit system routes (in terms of frequencies, service hours, and geography) is also a priority.

Plans which have special significance to PlanBTV include the **Waterfront South Access Study**, which developed alternatives for access and circulation to promote economic development in the southern portion of Burlington's Waterfront. The plan identifies various forms of a new grid street network to increase frontage and property access, remove truck traffic from neighborhoods, facilitate multimodal movements, and develop economic potential while accommodating the railyard.



In addition, construction plans for recommendations of the **Waterfront North Access Project** are currently in development, including:

- Re-alignment of northern Lake Street and the bike path, including pedestrian amenities, stormwater improvements, undergrounding of utilities, street lighting, landscaping, and parking, which will support adjacent development opportunities.
- Continued investigation of improvements to Depot Street to make it a bicycle/pedestrian only route and development of a stairway extending from Sherman Street to the Waterfront. These improvements will address public safety; enhance waterfront access from the Old North End, and upgrade stormwater, utilities and street lighting.
- Other concepts identified in the 2009 scoping study such as north-south transit along the Waterfront, in-slope parking, and funicular require additional study. With respect to the parking and funicular, the City should pursue partnerships with private property owners.

The **Burlington Transportation Plan** (BTP) assumes the role of the transportation element of the Municipal Development Plan. One of the most significant aspects of the 2011 Transportation Plan is its adoption of a Complete Streets strategy to accommodate all users. The Plan suggests different classifications for City Streets (e.g., Complete, Transit, Bicycle, Slow, State Truck Route, and Neighborhood) and provides guidelines for each type. Within the PlanBTV study area (Figure 2), the majority of the streets are “Slow Streets,” while Battery St. and Winooski Ave are “Complete Streets” that include transit, bicycles, and pedestrians. Pearl, Main, and St. Paul Streets are to be “Transit Streets” that prioritize efficient transit movement. Whether the roadway volumes can be accommodated by the Design Guidelines will need to be determined in case-by-case analyses.

Finally, implementing the comprehensive recommendations of the 2008 **Burlington Wayfinding Plan** is expected to address several issues, such as pedestrian connectivity and parking management. One of the primary targets for the Wayfinding Plan was parking garage identification and information.

Figure 2: Burlington Transportation Plan Adopted Street System



1.2 Circulation

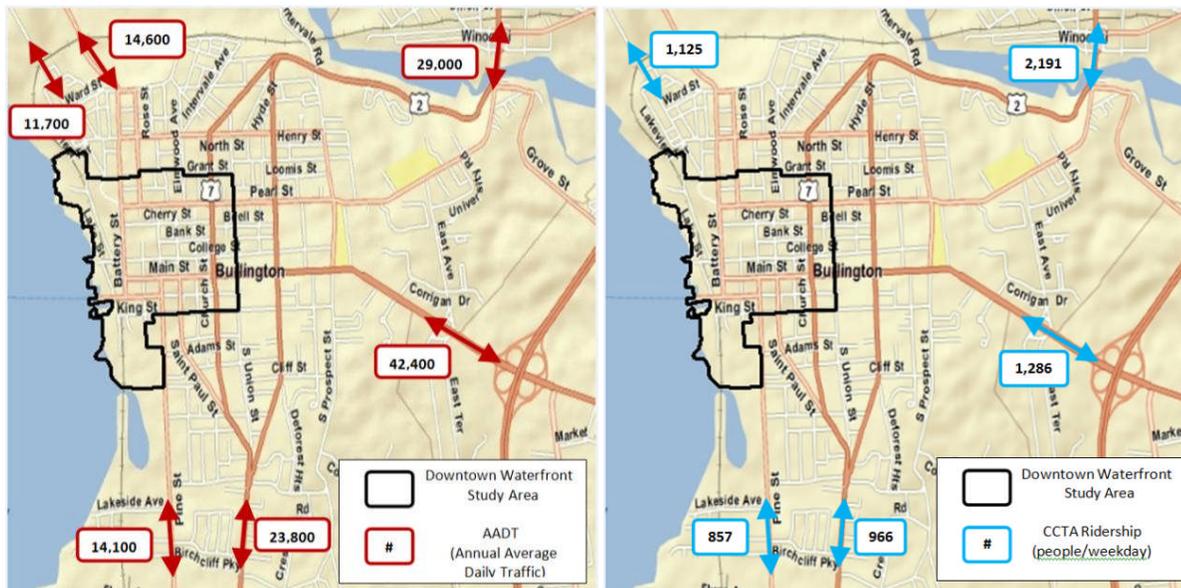
This section provides an overview of existing and future circulation conditions, including street design guidelines, transit and carsharing, traffic volumes, and bicycle and pedestrian circulation.

1.2.1.1 Arriving in Burlington

Figure 3 shows the proportions of traffic (Average Annual Daily Traffic or AADT) at each of Burlington’s six entry points. US 2/Williston Road is by far the largest gateway, followed by the Winooski Bridge, VT 127 & North Avenue (combined), and US 7/Shelburne Road. These splits differ from CCTA ridership: in Figure 4, the number of riders is shown for all CCTA routes entering at that point on an average weekday. The majority of riders enter Burlington from the northeast gateway at the Winooski Bridge. The North Avenue and US 2/Williston Road routes are the next largest, while ridership from the south is split between Pine Street and Shelburne Road.

Figure 3: 2007 Traffic Volumes (AADT) for Burlington’s Entry Points (source: CCRPC)

Figure 4: CCTA Average Weekday Ridership by Entry Corridor (source: CCTA 2010 Transit Development Plan)



1.2.1.2 Transit

The CCRPC Metropolitan Transportation Plan notes that approximately 40% of peak hour-person trips begin and end in Burlington, South Burlington, and Winooski. Therefore, improving transit service between these three areas may help to address the high volumes on Main Street, Pearl Street, and Pine Street (Figure 5). Although inter-regional services such as the LINK Express routes are needed and are very successful, focus on shorter, more local transit service has been suggested in previous plans and studies. Past recommendations to improve the transit system have included expanding system convenience, particularly by increasing service hours and frequencies on the major corridors that serve the City: North Ave, Colchester Ave/Pearl Street (VT 15), Williston Road/Main Street (US 2), and Shelburne Road (US 7). These routes have the highest ridership in the CCTA system. Looking forward, the College Street Shuttle is repeatedly identified as the model of how transit in Burlington should operate: high-frequency, convenient, user-friendly, and easy to understand.

Based on the Synthesis of Previous Plans and Studies (Section 2.0), two prerequisites to addressing transit service gaps are 1) developing a multimodal transportation center and 2) reforming the transit



funding framework to provide the adequate support and resources. The current funding framework is based on property taxes of the towns that are members of CCTA. Reforming this framework so that transit is funded by a dedicated transportation source such as a fuel tax, parking revenues, or driver's licenses/vehicle registration fees, are alternative funding possibilities.

1.2.1.3 Single Occupancy Vehicles

Burlington aims to create a “park once” situation for drivers either at the periphery of the City with high-frequency shuttle service into the downtown core for commuters, or within the core itself to serve shoppers and visitors. Figure 5 shows the volumes on the roadways within and approaching the study area: Main and Battery Streets carry the most traffic, followed by Pearl, Pine, and St. Paul Streets and North Avenue. The CCRPC MTP notes that the regional transportation demand model predicts significant congestion by 2025 along most of North Avenue.

Figure 5: 2007 Average Annual Daily Traffic (AADT)(source: CCRPC)



1.2.1.4 Bicycles and Pedestrians

The Downtown and Waterfront areas are quite walk-able, with a comprehensive system of sidewalks, crosswalks, and pedestrian signals. There are blocks where the streetscape is much more attractive and inviting to pedestrians. For example, it is generally considered that walking past pedestrian-scale storefronts and residences (such as on College Street) is more inviting than continuous stretches of undifferentiated exterior walls in evidence in some downtown locations. For bicycles, one of the most significant east-west barriers is the hill from the Waterfront to Downtown. In addition, bicycle facilities are mostly north-south rather than east-west.

1.2.2 Future Circulation

The future circulation analysis component of this study has been performed using the Chittenden County Travel Demand Model. This model represents daily traffic (AADT) and has been calibrated to 2005 traffic conditions. RSG has developed this model for the CCMPO. The CCMPO uses this model for a variety of transportation planning purposes, including for projecting future year land use and transportation activity.

For the PlanBTV Transportation Study, the CCMPO model was run to 2040, assuming 1% annual growth in the region's population and employment. From this “CCMPO 2040 Base Case”, a new “Burlington Downtown-Waterfront 2040 Base Case” was developed for this analysis incorporating specific future

growth within the study area provided by the Department of Planning and Zoning. The purpose was to test the impact on congestion of achieving a more favorable ratio of jobs to housing.

The model was run using the new Burlington Downtown-Waterfront 2040 land use to obtain traffic volumes and volume-to-capacity ratios for six arterial roadways²:

1. VT127
2. North Avenue
3. US7/Shelburne Road
4. Pine Street
5. Main Street/US2
6. Colchester Avenue/Riverside Avenue

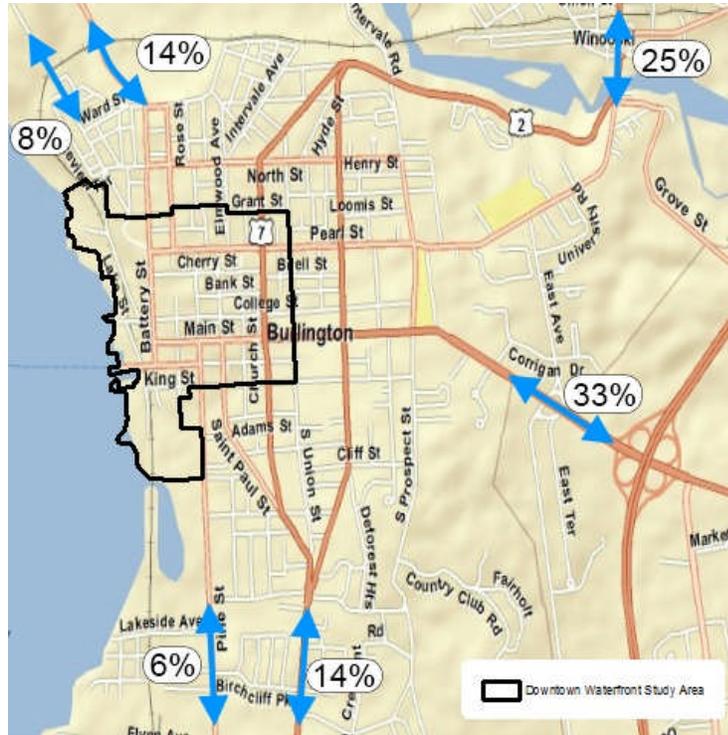
Figure 6 shows the source (or origin) of external traffic destined for locations within the study area.

The model was run to test circulation results for two scenarios, as follows:

1. **Scenario 1** includes three Park and Ride lots (Exit 14—1200 spaces, Exit 16—800 spaces, South End Transit Center—1000 spaces) as recommended in the 2011 CCMPO Park&Ride Plan. This scenario also includes increasing CCTA service frequencies to 15 minutes for the six routes serving the study area.
2. **Scenario 2** models a “balanced” land use scenario within the core study area, seeking to increase the amount of housing relative to jobs, as consistent with the Burlington Legacy vision. It includes the elements of Scenario 1 as well.

Table 1 summarizes the jobs and households located within the study area for each model scenario. For comparison purposes, the land uses assumed by the 2010 and 2040 CCMPO models are provided. Note that Scenario 1, which models higher CCTA bus frequency and implementation of the three intercept parking facilities, uses the 2040 BDW Base land use assumptions.

Figure 6: Source of External Traffic Destined for the Study Area¹



¹ The data in Figure 28 are from the CCMPO Travel Demand Model and represent projected 2040 travel conditions.

² Note that the v/c ratios reported are for roadway segments and not for intersections. Intersection v/c ratios are generally higher than roadway segment v/c ratios due to the presence of conflicting traffic. The roadway segment v/c ratios are best understood in comparison across the 3 alternative scenarios.



Table 1: Land Use Assumptions from the CCMPO Travel Demand Model for the Downtown-Waterfront Study Area

| | Jobs | Households | Jobs per household |
|---------------------|--------|------------|--------------------|
| 2010 CCMPO | 12,959 | 2,535 | 5.11 |
| 2040 CCMPO | 14,579 | 3,502 | 4.16 |
| 2040 BDW Base | 19,780 | 4,225 | 4.68 |
| 2040 BDW 'Balanced' | 14,579 | 4,858 | 3.00 |

The amount of new housing depicted in the 2040 BDW “Balanced” scenario represents a 91% increase in housing within the study area. This points to the need for substantially increasing allowable residential densities within the study area to achieve the land use vision expressed in the Burlington Legacy project. Specific zoning amendments will be necessary to facilitate increased residential densities. For this to be achieved the City will need to eliminate the limit set forth in Section 4.4.1 (d) 1.B. of the Comprehensive Development Ordinance which restricts residential use in the Downtown and Downtown Waterfront Districts to 50% of the gross floor area of a site.

For both scenarios and for both times of day, arterial link volumes are either equal to or less than the base case. Volume-to-capacity ratios are reduced as a result. Of the two scenarios, the “balanced” land use scenario, which concentrates significantly more residential development within the study area, is more effective at reducing arterial congestion. This point is reinforced by Figure 7 which depicts the downtown Burlington street network and shows the relative change in travel time between the 2040 Base Case and Scenario 1 (left) and Scenario 2 (right). The green highlighting indicates streets where delays are reduced >10% relative to the base case; red indicates areas where delays are increased >10% relative to the base case; and, no change indicates similar travel time performance between the base case and the scenario.

These figures indicate that both scenarios are effective at relieving congestion in the study area, but that Scenario 2 is significantly more effective since a much larger amount of trip making can be made with non-automobile modes due to the higher concentration of residents in the downtown.

Figure 7: Comparison of 2040 Base Case Travel Times with Scenario 1 and Scenario 2 Travel Times



This is a compelling result that supports the Burlington Legacy Vision and reinforces the transportation benefits of encouraging housing investment within the study area. Other initiatives within this project point to parking policies designed to encourage investment in downtown housing. Combined – the lower parking requirements and the positive travel time results – show that policies to encourage housing development in the downtown are synergistic.

1.3 Parking

In Burlington, the Department of Public Works manages the public parking supply, including parking meters and revenue collection. Public Works subcontracts enforcement to the Police Department. In 1999, the City established a Downtown Improvement District (which is roughly encompassed by this study area). An annual tax levied on nonresidential properties within the District funds a parking program which provides two hours of free parking in any designated municipally or privately owned or operated off-street parking facility within the District.

This section describes existing and future conditions.

1.3.1 Existing Parking Conditions

This section summarizes parking capacity and operations, occupancy, and ownership and use.

Figure 8: Parking Capacity in the Study Area by Type

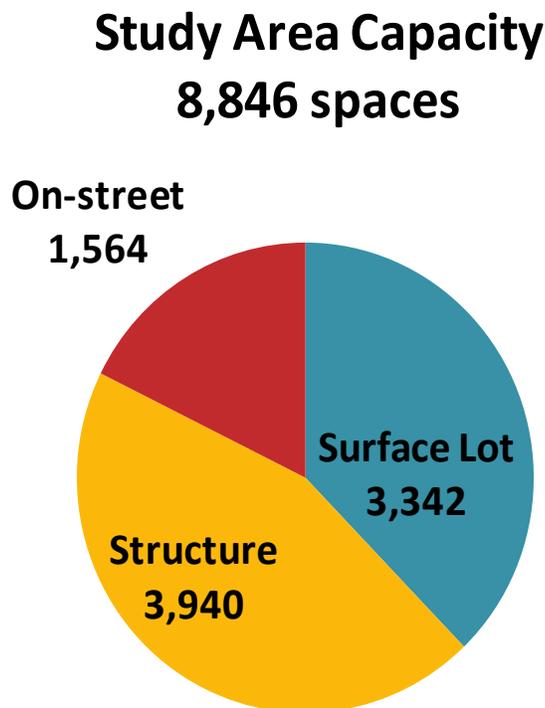
1.3.1.1 Parking Capacity and Operations

As shown in Figure 8, there are 8,846 parking spaces within the study area. The City's three downtown parking structures and the Burlington Town Center garage (privately owned but open to public parking) are able to offer the first two hours of parking for free thanks to the Downtown Improvement District. The majority of parking (not including leased or monthly permit parking) costs an average of \$1/hour; three facilities charge somewhat more or less.

1.3.1.2 Occupancy

Parking counts were performed in summer 2011 following the methodology of the 2003 Downtown Burlington Parking Study. The counts confirmed that the peak parking occupancy occurs between 1:00 and 3:00PM on Friday afternoon, when it is likely that weekend visitors are entering Burlington and overlapping with downtown employees who are still at work.

An occupancy of 85% is suggested as the level at which parking supply is used most efficiently because parking spaces are being used but there are still enough spaces empty to allow for turnover.¹ As shown in Figure 9, the total occupancy of the study area during the peak period was 65%, well below the 85% optimum. However, there are specific facilities and locations within the study area that are used more



¹ Donald Shoup (2005), *The High Cost of Free Parking*, Planners Press (www.planning.org).



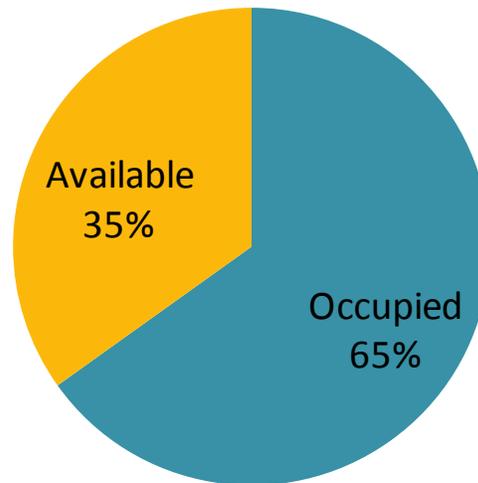
than others. The data are generally consistent with the patterns identified in the 2003 parking study, except that occupancies in 2011 were slightly lower.

Figure 10Figure 40 shows that on-street spaces are more occupied than garages and lots in Zones 2, 3, 4, and 9. This, combined with the highly visible conflicts that develop when the Marketplace garage (Zone 2) fills up, creates a strong perception that there is a shortage of parking. However, there are 988 empty parking spaces in the lots and structures of these zones at the same time;¹ 429 of these empty spaces are in Zone 2. Empty spaces are distributed throughout the zones (as opposed to a few specific facilities that are underutilized); however, since many are restricted to private property users and/or are difficult to find, they are underutilized.

This analysis suggests an opportunity for shifting parking demand to underutilized facilities such as the Lakeview garage (66% occupied), through improved user information (advertising 2-hours free parking in garages, as well as smart signs indicating available spaces three blocks away) and/or pricing (for example, installing parking meters with variable pricing technology to charge more during the peak period for parking adjacent to the Marketplace compared to a block or two away).

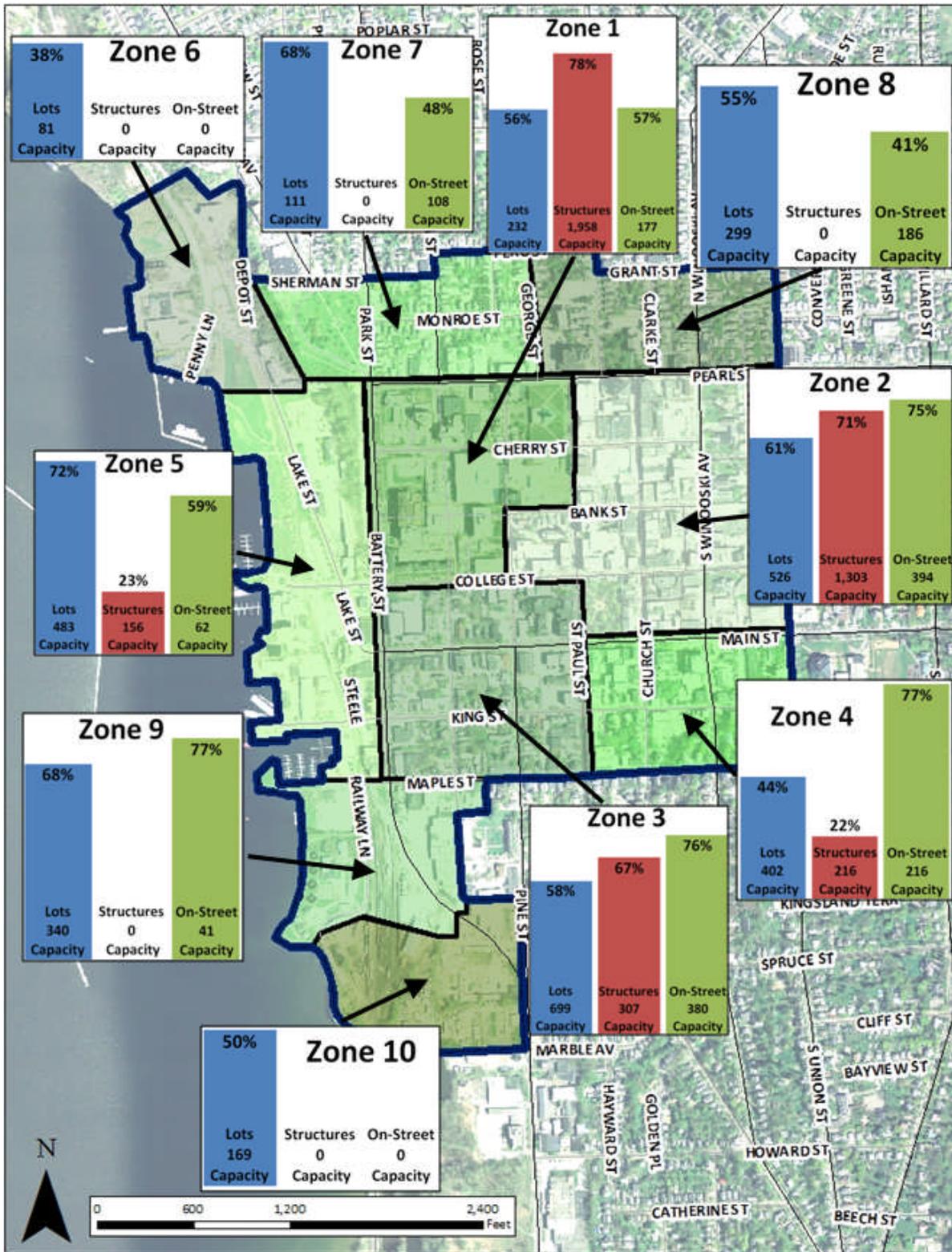
Figure 9: Total Parking Occupancy in the Study Area during the Friday 1-3PM Peak Period

Study Area Capacity: 8,846 spaces **Total Occupancy during Peak Period**



¹ This includes empty spaces in privately owned facilities that are only available to that property's affiliates. Shared parking arrangements, which would allow more people to use these facilities, would make more efficient use of the existing parking supply.

Figure 10: Zone Occupancy by Type of Parking



1.3.1.3 Facility Ownership and Use

As in the 2003 parking study, facilities were considered in light of ownership and use:

- Public/Public lots and structures are owned by the City and open to the public.
- Private/Private facilities are privately owned and are open only to the owners' clients and/or employees.
- Private/Public lots and structures are privately owned, but open to the general public.

In addition, there are facilities that are Private/Private during business hours, but open to the public at other times. For example, Main Street Landing's surface lot on the Waterfront is permit-only for tenants Monday through Friday until 6PM; at other times the general public can park there for a fee. This example presents a valuable opportunity for sharing parking: efficiency can be improved by sharing parking among uses during off-peak or non-operating hours.

Figure 11: Surface Lot and Structure Parking Capacity by Ownership/Use

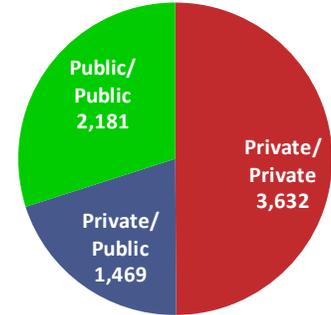
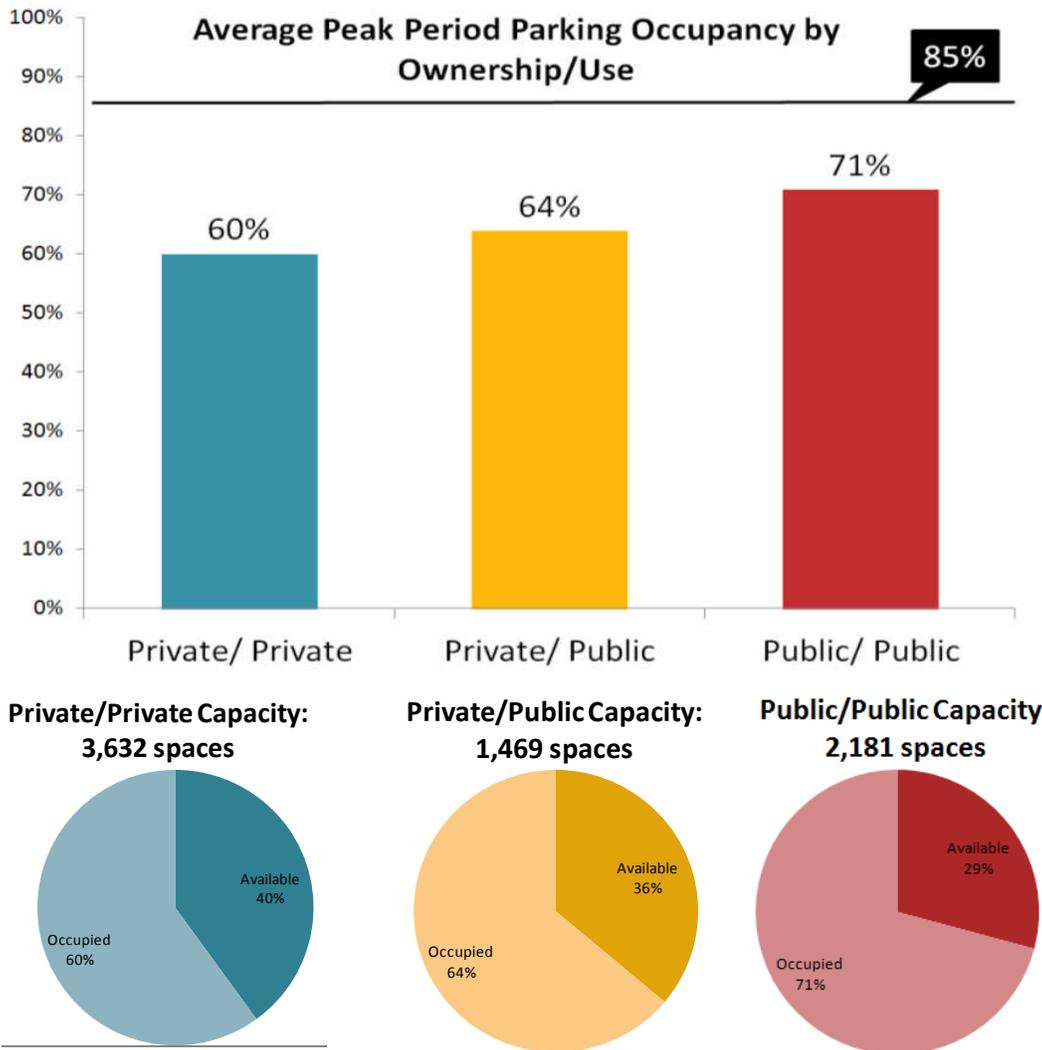


Figure 12: Peak Period Parking Occupancy by Ownership/Use



The Department of Public Works Traffic Division provided information regarding the amounts and sources of parking revenue - totaling approximately \$8.3M annually. This includes revenues from on-street parking meters, City-owned garages both downtown and at the Airport, and the Downtown Improvement District special assessment to provide 2-hrs of free parking downtown. While over 90% of these revenues are used to cover operations and maintenance, approximately \$780,000 of parking revenues are used to pay for a variety of non-parking programs such as traffic signals, flower planting, and school crossing guard programs.

1.3.2 Future Parking Conditions

An analysis of the future parking supply necessary to support 2040 land use within the study area has been conducted for the same scenarios as the future circulation analysis, Section 3.2:

- 1) the 2040 Base Case (business as usual)(19,780 total jobs and 4,225 total residences in the study area) ;
- 2) Transportation Improvements (3 new park&ride/intercept facilities and increased CCTA frequencies) (19,780 total jobs and 4,225 total residences in the study area); and,
- 3) Balanced Land Use (addressing the jobs/housing imbalance by increasing the amount of housing relative to jobs) (14,579 total jobs and 4,858 total residences in the study area).

The jobs and household estimates provided in Table 2 have been converted into gross square footage based on housing and commercial square foot estimates developed for existing conditions. To maintain an 85% parking occupancy rate, the analysis shows that a ratio of 0.83 parking spaces per 1,000 square feet of commercial building area is necessary. Parking requirements for residential uses are tied to the current zoning requirements of one parking space per dwelling unit.

Table 2 shows the results of this analysis. As the study area is currently under a surplus parking condition (peak occupancy is 65%), the study area can accommodate the additional growth to increase utilization to the 85% occupancy rate. However, under the assumptions of high job growth projected for the Burlington Downtown-Waterfront (BDW) Base Case, where employment in the study area increases from a little under 13,000 jobs in 2010 to nearly 20,000 by 2040, an increased requirement of over 3,000 parking spaces is projected. This amounts to a 34% increase in parking supply within the study area. This projection assumes the continuation of current parking requirements for residential dwellings of one space per residential unit.

Scenario 2, the balanced land use scenario, projects an increase of over 1,600 jobs and 2,300 housing units in the study area. Under this more balanced land use projection, an additional requirement of 1,654 parking spaces are projected as necessary (a 19% increase over existing supply), further supporting the positive impact on parking and circulation that a more balanced jobs-housing ratio could provide. As with the Base Case, this projection assumes continuation of current parking requirements for residential dwellings of one space per unit. These findings are summarized in Table 2.

Table 2: 2040 Jobs, Households, Commercial and Housing Square Footage, and Parking Supply within the Study Area

| | 2040 BDW Base | 2040 Balanced Land Use |
|-------------------------------------|---------------|------------------------|
| Jobs | 19,780 | 14,579 |
| Households | 4,225 | 4,858 |
| SF in Commercial (est.) | 9,268,222 | 6,831,214 |
| SF in Housing (est.) | 6,441,435 | 7,406,507 |
| BDW Parking Supply at 85% Occupancy | 11,880 | 10,500 |
| Net Change from Existing (8846) | 3,034 | 1,654 |



Incorporating parking management factors, as described in Section 5.0, would be consistent with the overall goals and objectives of concentrated downtown development. Assuming that parking reduction factors, implemented over the planning horizon to 2040, would reduce the parking requirement for residential units from 1 space per unit to 0.5 spaces per unit, parking supply within the study area would only need to increase by approximately 500 spaces above the current supply (a 6% increase). Note that further reductions in residential parking requirements to as low as 0.33 per unit may be possible. Hence, the foregoing analysis projects a more conservative future condition where parking requirements are reduced gradually as other supporting travel demand management measures are co-implemented. Table 3 shows the results of this analysis compared with the results from Table 2.

Table 3: Jobs, Households, Commercial and Housing Square Footage, and Parking Supply within the Study Area, Showing the Impact of Parking Reduction Policies for Residential Development

| | 2040 BDW Base | 2040 Balanced Land Use | 2040 Balanced Land Use with Parking Reduction Policies |
|-------------------------------------|---------------|------------------------|--|
| Jobs | 19,780 | 14,579 | 14,579 |
| Households | 4,225 | 4,858 | 4,858 |
| SF in Commercial (est.) | 9,268,222 | 6,831,214 | 6,831,214 |
| SF in Housing (est.) | 6,441,435 | 7,406,507 | 7,406,507 |
| BDW Parking Supply at 85% Occupancy | 11,880 | 10,500 | 9,338 |
| Net Change from Existing (8846) | 3,034 | 1,654 | 492 |

1.4 Parking Ordinance and Policy Review

The city of Burlington, Vermont has strategic planning objectives that include more compact development, reduced motor vehicle travel and shifts to alternative modes, and more affordable development. Current parking policies contradict many of these objectives. Various policy reforms which result in more efficient use of parking facilities and reduce parking supply requirements can better align parking decisions with strategic planning objectives.

Burlington currently imposes conventional minimum parking regulations and provides modest incentives and support to businesses and residents to more efficiently manage parking. The minimum parking regulations are often significantly higher than needed, particularly in areas with compact and mixed development, and multi-modal transport systems (good walking, cycling and public transit). These generous and inflexible standards tend to contradict many planning objectives, including efforts to reduce drunk driving, encourage urban infill, reduce vehicle traffic, and increase development affordability. The City reduces parking requirements in the Downtown and Shared Use districts, but even there parking requirements are often excessive and contradictory.

These regulations reflect an old parking planning paradigm, which assumes that parking should generally be abundant and free, and parking management need only be implemented in special conditions where increasing parking supply is infeasible. A new parking planning paradigm favors reduced and more flexible parking requirements with more emphasis on parking management strategies.

There are more than a dozen parking management strategies that may be appropriate in downtown Burlington. Some are already being implemented (such as transit access, walkability, and off-site parking), but could be applied more. Although individually their benefits may appear modest, typically reducing parking requirements at a particular location by just 5-15%, their impacts are cumulative and synergistic (total impacts are often greater than the sum of individual impacts), so an integrated parking management program can often reduce the number of parking spaces needed to provide a given level of service by 20% to 40%, and often higher if implemented with other transport and land use policy

reforms. This can provide substantial savings and benefits, making parking management the most cost-effective solution to many problems.

1.4.1 Parking Management Strategies

The following management strategies should be pursued in Burlington:

1. *Reduced and more flexible parking requirement.* Significantly reduce minimum parking requirements, particularly in central areas (downtown and nearby neighborhoods, and other major commercial centers). Incorporate standard adjustment factors by which minimum parking requirements are reduced for specific demographic, geographic and management factors. The existing conditions assessment of this report suggests that parking occupancies are generally lower than the recommended 85% level, so the parking supply is not being used as efficiently as it could be. Therefore existing facilities should be managed more efficiently rather than building additional parking that will not be optimally used.
2. *Improve user information.* Providing convenient information to travelers on their parking supply and pricing options (such as real time information on the location and price of available parking spaces), and travel options (such as how to use public transit) allows travelers to choose alternative parking locations and transport options. The existing conditions assessment and stakeholder input indicate that finding parking is difficult, which speaks to the need for better user information to improve parking efficiency.
3. *Public-private partnership (PPP).* A PPP could provide parking brokerage services (facilitating sharing of parking facilities among downtown businesses) and provide other parking and transportation management services. Currently, the lack of a single entity to organize and facilitate transportation and parking demand management programs and strategies prevents Burlington from realizing a more efficient and seamless transportation system. A PPP would organize services such as Guaranteed Ride Home Programs, bicycling and walking incentives, transit pass subsidies, parking brokerage and shared parking facilitation, and parking system data collection and management. The PPP could be funded by a parking enterprise fund, as described below.
4. *Shared parking.* As much as possible, parking facilities should serve multiple destinations, particularly downtown. This means encouraging use of on-street (curb) parking and shared off-street parking facilities in place of individual, dedicated off-street parking facilities at each destination. Shared parking would be facilitated by a PPP and would improve the utilization and efficiency of existing facilities that are less than 85% occupied during peak periods, reducing the need to build new parking.
5. *Parking enterprise fund.* This fund would generate revenue for parking demand management and operations management of existing facilities. The fund would be paid into as an alternative to building parking supply on private parcels. In contrast to in-lieu fees, this enterprise fund would be assured to be reinvested into the system. The enterprise fund would be used to pay for improvements such as parking wayfinding, meter upgrades, data collection, and parking demand management programs and services.

1.5 Parking & Transportation Issues and Opportunities

To inform this section, we met with developers to gain an understanding of their experiences with development in Burlington and the barriers that they encounter. Based on these meetings, the synthesis of prior plans & studies, the existing conditions assessment, and the review of the current parking ordinance, the following issues and ideas have been identified.



1.5.1 Parking

1. *Issue:* There is a common perception that there is a shortage of parking within the study area, and most agree that parking is very difficult to find due to a lack of user information. The parking inventory and utilization analysis, however, shows that parking is not being used optimally; that is, even during the peak period, most parking facilities (with the exception of on-street and the Marketplace garage) are less than 85% occupied. Therefore, while there may be some limited opportunities to create additional parking over the long-term, **the City's priority should be to manage existing parking resources more efficiently.**
2. *Issue:* Since parking can be very difficult to find, visitors and customers get frustrated with Burlington before they even get out of their vehicle. The **parking experience needs to be improved,** as this is the first impression of Burlington that visitors and customers will have.
3. *Issue:* Currently, cost and the availability of space for **parking determines redevelopment potential.** Therefore, one of the reasons that infill development is not taking place at the rate at which the City would like is because the requirements to provide parking make many projects infeasible from the developers' point of view. How can parking be managed and regulated so that it is not a barrier to infill development? What regulatory and management strategies can be implemented to provide alternatives to increasing parking capacity?
4. *Opportunity:* Being **pro-active in parking management,** for example, deploying new meter technologies, working with private property owners and developers to share parking, collecting data and surveying users, developing and administering demand management programs, etc., will help to improve efficiency. Public Works is in the process of improving **parking payment systems/meters and wayfinding.** This will enable management strategies that involve pricing, such as variable/peak period pricing, and improve user information. Wayfinding will reduce congestion resulting from drivers circulating as they hunt for a parking space. In addition, there are many great ideas and strategies to manage parking, but these initiatives need a home in order to be implemented. A **public/private partnership** to organize these efforts and to manage daily operations of the parking supply is needed.
5. *Issue:* **Lack of ongoing parking data collection.** Specifically, utilization (including turnover), user groups, and any spillover parking issues should be monitored so that operational issues can be identified and addressed. For example, parking leases could be moved to underutilized facilities if occupancy data were more readily available. Particularly because parking demand fluctuates depending on time of day, week, and year, ongoing data collection (such as a parking census) is needed to indicate parking trends and management gaps. As the saying goes, "you can't manage what you don't measure."
6. *Opportunity:* **If additional parking were needed in the future, where could it be built? How could it be paid for?** Does the current distribution of parking support Downtown and Waterfront destinations; is parking located where it is needed now and in the future? New parking would likely take 5-10 years to develop. Therefore, optimizing efficiency and use of the existing parking supply as a resource is necessary to minimize the need for new parking.

1.5.2 Circulation and Connectivity

1. *Opportunity:* There is an opportunity to develop **a seamless transportation system,** particularly through improvements to transit and to bicycle/pedestrian connectivity. The quality of existing transportation alternatives is not adequate to attract choice users and reduce parking and transportation demand.
2. *Opportunity:* Developing Park&Ride facilities to **intercept traffic entering the core.** Creating off-site parking connected to downtown via high-frequency shuttle will reduce parking demand and congestion in the core.

3. *Opportunity:* Improvements to **bicycle and pedestrian connectivity** (particularly Downtown to Waterfront, and north-south and east-west bicycle connections).
4. *Opportunity:* Improving **walkability**: even though physical infrastructure may be in place, the experience is not pleasant enough to attract pedestrians (e.g. College Street vs. Cherry Street).
5. *Opportunity:* To improve parking efficiency, enhanced **traveler information** such as signs, maps, websites, and GPS, should be integrated to indicate parking availability relative to popular destinations. Improvements to **wayfinding**, including real-time parking information, are currently underway by the City.

1.5.3 Land Use

1. *Opportunity:* **Downtown's function as a 'neighborhood'** needs to be maintained; it cannot serve visitors only, it needs to include services for residents and employees.
2. *Issue:* **Jobs/housing balance**: land use in the study area is heavily imbalanced toward jobs. Significant advantages are generated when jobs and housing are in better balance. Incentives to construct downtown housing, including reduction in parking requirements and enabling the unbundling of parking from housing, would help reduce barriers to infill housing development. Community input has specifically suggested a shortage of mid-level/"workforce" housing.

1.6 Recommendations

This section presents regulatory, organizational, and infrastructure recommendations to overcome parking and transportation barriers to infill development. This study has indicated that parking is underutilized because available spaces are hard to find and many spaces are restricted to private property owners and their clients. The study has also shown that addressing the jobs/housing imbalance in Burlington is estimated to more positively impact congestion and parking demand than transportation improvements alone. The recommendations focus on ways to improve parking efficiency to effectively utilize existing parking capacity, reduce parking demand, and stave off the need to build additional parking until existing resources are shown to be utilized to their fullest capacity.

1.6.1 Regulatory Recommendations

- **The primary recommendation of this study is to focus on residential development in the study area.** Not only does addressing the housing-jobs imbalance¹ in Burlington help to reduce congestion and parking demand by allowing more employees to walk, bike, or take transit to work, but there are also several tools to manage the parking demand associated with residential development. Section 4.4.1 (d) 1.B. of the Comprehensive Development Ordinance limits residential use in the Downtown and Downtown Waterfront Districts to 50% of the gross floor area of a site; this limit should be eliminated and the residential/non-residential mix of uses determined by the market.
- **Facilitate and encourage shared parking.** Because much of the existing parking supply in Burlington is restricted to private property owners and their clients, making existing parking accessible to more people is critical to increasing efficiency. The strategy is to use existing parking more intensively (for more hours of the day) rather by working with the private owners to develop arrangements that can make these spaces available to more potential users and thus improve their efficiency.

¹ As noted in the Burlington Municipal Development Plan, the CCMPO Metropolitan Transportation Plan, the CEDO Economic Development Plan, and others.



- **Parking requirements should be more flexible for developers if they incorporate demand offsetting elements** such as: being located near carshare pods; including vehicle limitation covenants or unbundled parking for residential developments; arranging shared parking.
- **Consider creating a parking enterprise fund.** The enterprise fund would be used to pay for improvements such as parking wayfinding, meter upgrades, data collection, and parking demand management programs and services.

1.6.2 Organizational Recommendations

City staff and developers have agreed (in meetings for this study) that **the public and private sectors have their strengths and weaknesses and should work together through a public-private partnership (PPP) for an optimal result.** Currently, the lack of a single entity to organize and facilitate transportation and parking demand management programs and strategies prevents Burlington from realizing a more efficient and seamless transportation system. The PPP would manage parking and provide a single point of contact to **organize and coordinate the multitude of parking facilities and operate the parking supply as one system.** The PPP could be funded by a parking enterprise fund as described above. Among its functions would be:

- **Broker parking arrangements and negotiate shared parking.**
- **Provide a home for Transportation Demand Management (TDM) programs.** It is important to keep in mind that TDM **solutions are not all-or-nothing.** Implementing an employee commute reduction program does not mean that employees can never drive into Burlington ever again- even switching to an alternative mode just one day per week would be a 20% reduction in demand. **Flexibility can and should be built into solutions.**
- Data collection and **developing/maintaining a parking database** is important to being able to plan and manage the parking supply effectively. The PPP would collect and maintain data to inform how, where, and when parking is used in order to support daily operations and management decisions, and to plan for future use.
- Parking is hard to find and much of the existing parking supply in Burlington is restricted to private property owners and their clients. The result is underutilized parking: this study and the 2003 Downtown Burlington Parking Study indicate that peak period occupancies do not typically meet the suggested 85% target for maximum efficiency. (Although specific facilities such as the Marketplace garage do reach capacity, there is available capacity at nearby sites such as Town Center, College Street, and Lakeview.) **Parking efficiency needs to be improved through traveler information, wayfinding, marketing, data collection, technology updates, and other management strategies to guide people to the unused parking.** As the manager of daily operations, the PPP would be responsible for this critical part of the parking system. Improvements to wayfinding (including electronic parking signs) are currently underway by the City of Burlington.

1.6.3 Infrastructure Recommendations

The first priority put forward by this study is to improve efficiency in the management, operation, and utilization of existing parking facilities; still, the future parking analysis estimates that about 500 additional spaces would be needed by 2040 given the assumed parking requirement adjustments. Therefore, a critical question to be answered is: **If new, additional parking capacity were needed, where, when, and how could it be built?** While the recent CCRPC Park & Ride Plan has identified intercept facilities (Exit 14, South End Transit Center, I-189 & Shelburne Road), other studies¹ have identified potential locations for new parking within the study area. Options that have been identified over the years include:

¹ Waterfront North (2009) and Waterfront South (2010) Access Studies.

- the lot on the southwest corner of Main and St. Paul Street: currently occupied by TD Bank;
- the “Superblock” on the northeast corner of Main Street and South Winooski Avenue;
- a parking garage built into the slope on the west side of Battery Street between Cherry and Pearl Streets;
- a garage on the existing surface lot west of Vermont Wine Merchants and northeast of the railyard;

Staff agree that the timeline for new structured parking would be at least 5 to 10 years and would likely require a public-private partnership to develop.



1.0 INTRODUCTION

The development of a land use and development plan for Burlington's Downtown and Waterfront has been a long-standing action-item in the City Municipal Development Plan since at least 1996. While many other planning efforts involving the Downtown or Waterfront have taken place over the years, none have been as comprehensive in scope and strategic in design.

In the fall of 2010, Burlington's Planning and Zoning Department received a Sustainable Communities Challenge Planning Grant from the US Department of Housing and Urban Development providing a unique opportunity to invest in the future and advance Burlington's place as one of America's most livable and sustainable communities. Burlington struggles to address complex urban challenges in a small, under-resourced New England community with big ideas and even bigger ideals.

The plan, known as PlanBTV, will refine broad city-wide goals for sustainable development into focused, actionable, area-specific strategies to ensure the vitality of the central core of our community and enable us to achieve our community vision. The planning process will place an emphasis on ways to promote and improve mixed uses and quality urban design, affordable and workforce housing, transportation and parking management, and the quality and capacity of public infrastructure. The intent is to identify, understand, and address current barriers to the creation of new infill development.



The planning process, and the transportation study in particular, will help to address many questions regarding the future of Burlington's Downtown and Waterfront, including:

- How to balance mitigation of traffic congestion and parking demand with desires for expanded public transit?
- How to leverage future downtown development to facilitate and support expanded public transit service and vice-versa?
- What public investments can we make that improve lake quality, reduce stormwater overflows, save energy, improve traffic flow and safety?
- How to encourage and support more "green" building and development?
- How to grow smarter and use our compact mixed-use urban form as a tool to reduce greenhouse gas emissions?

1.1 PlanBTV Goals/Desired Planning Outcomes

PlanBTV will provide recommendations, tools, and strategies that will help achieve the following goals and outcomes:

- Maintain Burlington as a regional population and economic center that offers meaningful jobs at livable wages and a diverse housing stock that serves all incomes, while encouraging the continued growth of the city's commercial the tax base.
- Promote urban development measures that facilitate economically competitive, environmentally sound, socially responsible, and aesthetically-pleasing land-use combinations and urban design elements.
- Emphasize the importance of preserving historic and cultural features and architecture, and encouraging high-quality building design to complement the existing fabric.

- Strengthen the linkages between the Downtown, Downtown Waterfront, and surrounding neighborhoods, including the Hill institutions (University of Vermont, Champlain College, and Fletcher Allen Health Care).
- Promote a mix of land uses including the need for affordable/workforce housing, both local and world class businesses, entertainment and culture, live/work spaces, etc.
- Provide a focused sustainable transportation and accessibility system within the context of the existing street network and emphasizing alternatives to the single occupancy vehicle (SOV). This should build upon the Complete Streets system and Street Design Guidelines already included in the adopted Citywide Transportation Plan.
- Provide a comprehensive parking allocation and management system that meets visitor, business, and resident needs consistent with the goal of increasing public transit and reducing dependence on the single-passenger automobile.
- Provide the quality and capacity of public infrastructure, including pedestrian, bicycle, parking, and/or transit-related facilities, necessary to support new or expanded commercial and residential development.
- Strengthen Burlington's leadership position in clean energy and climate action planning by enabling broad-based community participation in the identification, quantification, visualization, and decision-making related to the energy and greenhouse gas impacts.
- Provide the foundation for the development of a code for the Downtown and Downtown Waterfront to guide and regulate future development in a coherent and consistent manner centered on urban form, design, and performance.

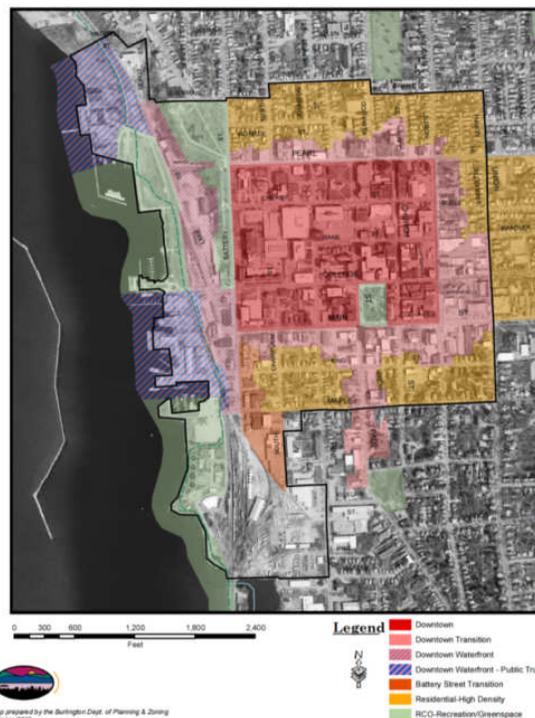
1.2 PlanBTV Transportation Study

The central goal of PlanBTV is to identify, understand, and address current barriers to new infill development. This Transportation Study for PlanBTV provides important information, perspective, analysis and recommendations that will be used to inform the planning process with regard to parking and circulation, and includes the following elements:

- Synthesis of Prior Plans and Studies
- Existing and Future Circulation
- Existing and Future Parking
- Parking Ordinance and Policy Review
- Involvement and Participation of Local Planning and Development Stakeholders
- Recommendations for Overcoming Transportation and Parking Barriers to Infill Development

The study area is shown in Figure 13. Rather than serve as a stand-alone plan, this report and the information, analysis, and recommendations provided in it are intended to inform the upcoming master planning and code development phases of PlanBTV.

Figure 13: Study Area and Land Use Zoning



2.0 PRIOR PLANS AND STUDIES

This section summarizes the Synthesis of Previous Plans and Studies which is included in Appendix A. The City has sponsored many parking and circulation studies over the past 10 years. Combined with studies conducted by other entities, such as the Chittenden County Regional Planning Commission (CCRPC, the former Chittenden County Metropolitan Planning Organization/CCMPO), Hill Institutions and the private sector, there is an invaluable storehouse of information upon which PlanBTV can draw.

2.1 City-wide Themes

The visions and goals set forth by almost all of the plans focus on quality of life, sustainability, environmental health, access to multimodal transportation, and developing economic potential.

- **Quality of life** pertains to residents' everyday life in their neighborhoods.
- **Sustainability** usually refers to establishing a way of life that does not rely so heavily on so many resources as to someday become unfeasible.
- As described in these documents, **environmental health** usually involves reducing fossil fuel consumption, Greenhouse Gas emissions (GHG), the City's carbon footprint, and/or vehicle miles traveled (VMT).
- Fostering a **multimodal transportation system** (particularly transit, bicycle, and pedestrian modes) and expanding access to it is a goal of a majority of the plans.
- **Developing economic potential**, such as strengthening the regional economy or maintaining Burlington's role as the center of the county economy, was the most frequently established goal.

Nearly all the documents called for an investment in new and/or existing infrastructure, showing a focus on developing the physical framework that supports the area's economy, quality of life, environmental health, sustainability, and transportation system. Limited new infrastructure (such as the Southern Connector/Champlain Parkway) was noted, but maintaining what is already in place was emphasized and shows a sense of fiscal responsibility.

The common theme expressed in the reviewed plans and studies is the need to **develop a seamless transportation system that provides high bicycle and pedestrian connectivity and convenient, reliable, and comfortable transit** that will increase ridership by improving access and attracting choice riders. This focus will help to achieve another widely noted strategy, reducing the number of private vehicles that enter Burlington.

Improving access to parking could be viewed as a strategy that would encourage driving in the City. But the strategy as described in the documents is more about improving parking efficiency, traffic circulation, and the users' experience (and consequently economic vitality). One example of a parking access improvement is clear, consistent wayfinding that includes real-time information to reduce VMT from vehicles on the hunt for a parking space. The strategy remains open enough to allow for different actions and solutions to be developed. Likewise, emphasizing Waterfront parking on the east side of Battery Street preserves the Waterfront area from becoming automobile-dominated and encourages travelers to use alternative modes. Actions to pursue this strategy include parking management systems, wayfinding, construction of parking structures, strengthening pedestrian connections across Battery Street, and others.

Intensifying land use and the diversity of uses to make the most of limited space was another common theme of the documents. Burlington's Municipal Development Plan (MDP) encourages following a **growth center/compact development pattern** with high-density growth and mixed use development, promoting public transit, walking and biking as the preferred forms of transportation. The Plan notes

that many properties in Burlington are underdeveloped¹ and could be used more intensely with multiple uses, taller buildings, and smaller setbacks. Surface parking is a specific example of redeveloping properties for more intensive use and making the most efficient and effective use of space.

The dominant theme learned from the document review was the need for **housing** in Burlington. An imbalance between housing and job growth hinders the economy while leading to unsustainable land use patterns and transportation systems. Increasing housing will strengthen Burlington's role as the regional growth center and the viability of the transportation system. The CCRPC's Metropolitan Transportation Plan (MTP) 2025 notes that housing demand created in the 1990s has not been satisfied in the County and that over the MTP's 25-year planning horizon, a 61% increase (or demand for an additional 35,700 units) is expected (~2% annual growth in demand; note that more recent trends suggest the ambitious growth rates anticipated earlier in the 2000 - 2010 decade have slowed and that annual growth rates for housing are now between 1 and 1.5%). The MTP stresses that improvements to the transportation system's performance hinge on establishing a land use pattern of concentrated development centers: **"the success of future transportation system investments...is dependent upon achieving the development pattern" of 45% of housing and 45% of employment within the Metropolitan Areas** (which include all of Burlington)." (CCRPC MTP 2025 Chapter 5) Under Burlington's current zoning, there is minimal residential use, and of this, there are only two high density residential parcels. Section 4.4.1 (d) 1.B. of the Comprehensive Development Ordinance limits residential use in the Downtown and Downtown Waterfront Districts to 50% of the gross floor area of a site.

Another common theme from the document review was the need for improved **parking management**, such as wayfinding improvements and implementation of 'smart signs' that convey real-time parking information. There is a strong need to implement a system that maximizes the efficiency of existing parking facilities rather than increase capacity. Implementing the 2008 Wayfinding Plan and related initiatives (such as developing a Downtown transportation management association (TMA)) have been suggested in previous documents to help accomplish the deployment of a parking management system. However, capacity increases in the form of Park&Ride and intercept facilities are recommended as they intercept vehicles before they enter the core. Specifically, facilities to the south (South End Transit Center); east (Exit 14/behind the Sheraton); and north (VT 127) of the City have significant momentum and are included in the 2011 CCRPC Park&Ride Plan.

Two elements are established by previous plans as the basis for achieving a seamless multimodal transportation system in Burlington and the region: 1) a strong transit system, and 2) facilitating bicycle and pedestrian access and connectivity.

Transit system improvements recommended by previous plans involve updating existing services to resemble the College Street Shuttle, as well as designing new routes. The College Street route's high-frequency (15-minute), free fare, and easy-to-use convenience and comfort has a positive image and attracts high ridership, including choice riders. Many plans cite the Shuttle as the standard to which other CCTA routes should be raised. Another common recommendation is for the development of a **multimodal transportation center**. CCTA identifies this as its "most needed facility investment" in its 2010 Transit Development Plan. A multimodal transportation center is critical in advancing improvements in the overall system. Expanding transit system routes (in terms of frequencies, service hours, and geography) is also a priority. Several of the documents recognize that transit funding is in need of reform in order to implement any improvements.

A non-CCTA transit action recommended in several documents is the re-introduction of passenger rail. The 1998 Waterfront Revitalization Plan suggested that it may be challenging to reconcile this initiative with efforts to relocate the railyard from the southern part of the BTV study area. The Waterfront Revitalization Plan notes that:

¹ "Underdeveloped" refers to those parcels that are developed at less than 50 percent of the average of the existing or allowable density in the zoning district.



While the City encourages the expansion of passenger rail, the railyard is a potential obstacle to development of the Waterfront as a publicly accessible community resource.

By moving the railyard off the Waterfront, truck traffic through residential neighborhoods would be eliminated. Noise would be dramatically reduced. There would be a positive impact on Burlington's south end neighborhoods. The storage and handling of hazardous materials would be eliminated. Relocation of the railyard would provide an opportunity to create mixed use development on those lands.

On the other hand, relocation of the Vermont Railway yard off the waterfront could possibly mean the loss of rail infrastructure in the City and would further sanitize the Waterfront from its industrial heritage. The movement of goods by rail is far more sustainable, efficient, economical and environmentally responsible than trucking. Future opportunities to transfer goods for manufacturing and public use by rail should not be discarded without careful consideration. (page 26)

2.2 Plans Specific to the PlanBTV Study Area

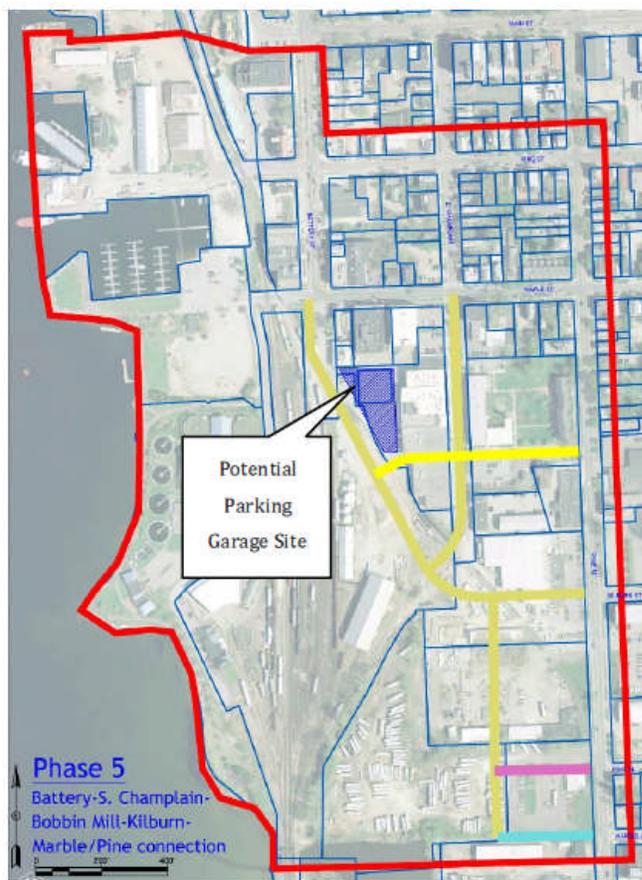
The **Waterfront South Access Study** developed alternatives for access and circulation to promote economic development in the southern portion of Burlington's Waterfront. The plan identifies various forms of a new grid street network to increase frontage and property access, remove truck traffic from neighborhoods, facilitate multimodal movements, and develop economic potential while accommodating the railyard. The study area, bound by Lake Champlain, Main and King Streets, Pine Street, and the Barge Canal, is shown in Figure 14.

The transportation analysis from this plan estimates that the street grid system outperforms the no build/base case in terms of travel time and intersection Level of Service (LOS), especially at the four-way stop at the Pine-Maple intersection. The project was estimated to cost \$13M to \$13.3M to construct.

Connections between the Waterfront and Downtown have been recommended in several documents. Most recently, the purpose of the **Waterfront North Access Project** is:

"To enhance travel access to and on the Waterfront and to improve connections to the remainder of Downtown with the goal of creating jobs and enhancing economic

Figure 14: Waterfront South Study Area and Proposed Grid Street Alignment (broad yellow, pink, and turquoise lines depict proposed streets)



vitality. It is part of an ongoing effort to put in place public infrastructure to reclaim Burlington's formerly industrial downtown waterfront in a manner that both drives the regional economy and enriches quality of life by enhancing public access to and enjoyment of the Lake Champlain shoreline."¹

The Waterfront North Access Project is needed to:

- Improve pedestrian crossings of city streets while maintaining adequate traffic flow.
- Facilitate pedestrian travel down to the Waterfront from the heights, including improving access to Depot Street.
- Improve stormwater management along northern Lake Street.
- Promote access to the Moran site; provide for future access to the Urban Reserve.
- Develop north-south travel alternative to Lake Street.

As a result of the public process and review by the Waterfront Marketplace Downtown (WMD) advisory group; Planning Commission; Public Works Commission; and Transportation, Energy, & Utilities Commission, the following recommendations were made:

1. Pursue a Phase 1 project consisting of:

- Re-alignment of northern Lake Street and the bike path, including pedestrian amenities, stormwater improvements, undergrounding of utilities, street lighting, landscaping, and parking, which will support adjacent development opportunities. (Recent plans show approximately 170 new parking spaces at the redeveloped Moran Plant.)
- Stormwater upgrades to Lake Street that do not preclude future north/south transit opportunities.

2. Plan to address the following during future phases:

- Signal timing improvements and hardware upgrades to Battery Street.
- Continued investigation of improvements to Depot Street to make it a bicycle/pedestrian only route and development of a stairway extending from Sherman Street to the Waterfront. These improvements will address public safety; enhance waterfront access from the Old North End, and upgrade stormwater, utilities and street lighting.
- North-south transit and Waterfront parking should be investigated and a plan developed.
- A pedestrian bridge from Depot Street to the parking near the Moran building should be considered as part of the next phase of Moran.
- Additional improvements to Battery Street require further investigation to determine impact on levels of service to all modes.
- Other concepts identified in the 2009 scoping study such as north-south transit, in-slope parking, and funicular require additional study. With respect to the parking and funicular, the City should pursue partnerships with private property owners.

Construction plans for Phase 1 of the Waterfront North projects are currently in development.

The ***Burlington Transportation Plan*** (BTP) assumes the role of the transportation element of the Municipal Development Plan. The plan recognizes that the Downtown, Waterfront, and Hill are major job centers, while the enterprise zone (Pine Street Corridor, enterprise zone south of Waterfront, and industrial areas between Home and Flynn Avenues) may be future centers of growth for the City. During development of the Plan, transportation concerns expressed by businesses in the Downtown and Waterfront areas were parking availability, congestion, and wayfinding.

¹ CEDO project website: http://www.cedoburlington.org/waterfront/waterfront_access_north_project.htm



One of the most significant aspects of the 2011 Transportation Plan is its adoption of a Complete Streets strategy to accommodate all users. The Plan suggests different classifications for City Streets (e.g., Complete, Transit, Bicycle, Slow, State Truck Route, and Neighborhood) and provides guidelines for each type. Within the PlanBTV study area (Figure 15), the majority of the streets are “Slow Streets,” while Battery St. and Winooski Ave are “Complete Streets” that include transit, bicycles, and pedestrians as shown in Figure 16. Pearl, Main, and St. Paul Streets are to be “Transit Streets” that prioritize efficient transit movement.

Figure 15: Burlington Transportation Plan Adopted Street System



The BTP establishes the first priority for transportation as maintenance of the current system, followed by the implementation of funded capital projects, including improving:

- access to Waterfront North and updates to Depot Street
- Waterfront South access through the railyard (addressed in the Waterfront South Access Project)
- side streets off Church Street Marketplace
- wayfinding
- the Burlington bike path

Projects to be developed include:

- the Downtown Transit Center
- South End Transit Center
- Southern Connector/Champlain Parkway
- bicycle connection to Winooski
- implementation of the North-South Bicycle Plan

Figure 16: Guidelines for a Complete Street (Burlington Transportation Plan 2011)



The Plan establishes the following policies to support:

- a Downtown TMA
- passenger rail to Burlington
- alternative funding sources for public transit
- carsharing
- changing zoning parking requirements to allow impact fees or payment-in-lieu options.

The BTP proposes three parking pricing pilot programs to influence use and spread demand to underutilized areas, encourage transportation alternatives, and increase parking revenue. The first pilot program is targeted at on-street spaces in the Downtown and replaces existing parking meters in high demand areas with variable pricing meters that accept credit cards. Meters would remain in effect into the evening rather than ending at 6PM as they currently do.

The second pilot program would focus on the Waterfront and would charge for parking throughout the year rather than only seasonally. The last pilot would expand the residential permit program to address on-street spaces in neighborhoods and would sell a limited number of non-residential permits for daily parking.

The BTP notes that the City has a 'no net loss' parking policy, so that spaces lost to redevelopment must be replaced somewhere. Options for adding parking supply include expanding the Marketplace garage, or adding on-street spaces by converting streets to one-way. Parking has also been considered at the TD Bank site and the "super block." Relocation of the Cherry Street bus terminal would also provide additional capacity. The Plan re-affirms the preference to avoid adding parking on the Waterfront. The



BTP supports development intercept parking facilities at the future South End Transit Center and at Exit 14.

A major factor in strengthening connections throughout Burlington is wayfinding. In some documents, wayfinding was considered to be even a greater issue than parking. Implementing the comprehensive recommendations of the 2008 *Burlington Wayfinding Plan* is expected to address several issues, such as pedestrian connectivity and parking management. The Wayfinding Plan includes an implementation schedule of sign types and locations, complete with graphic standards for consistency. Some basic repairs have been completed as of October 2011, but the real-time data parking signs have not been installed.

Figure 17: Parking Garage Signs (Wayfinding Plan Presentation, page 20)

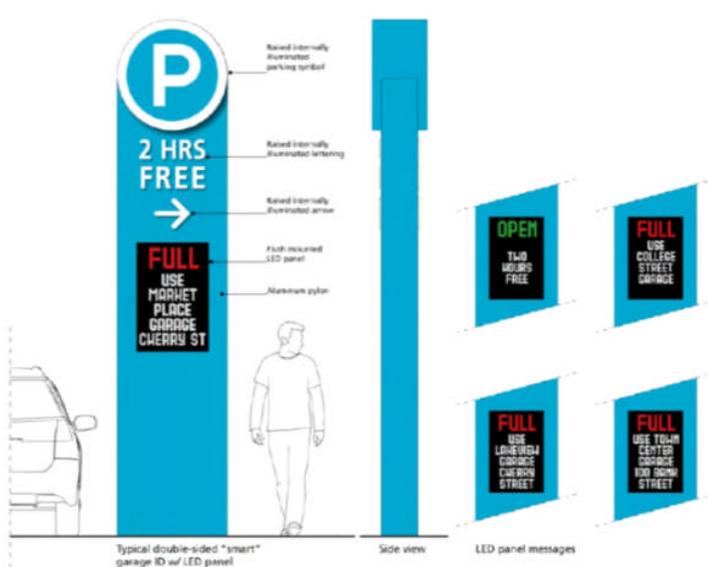
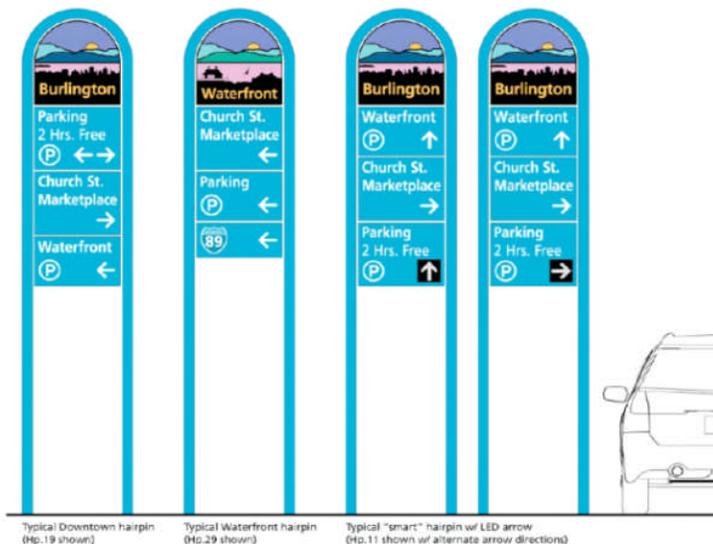


Figure 18: Updated Hairpins (Wayfinding Plan Presentation, page 18)



The Wayfinding Plan inventoried the existing wayfinding system in the City and found it to be in serious disrepair. Sign clutter, missing signs, inconsistency, inadequate placement, confusing messaging, and worn/faded/broken/vandalized/damaged signs are throughout the City. The Plan recommended

replacing signs in disrepair on the Waterfront, Church Street Marketplace, and parking; updating graphics standards; budgeting for future sign replacements; and developing maintenance standards and allocating funds for annual maintenance.

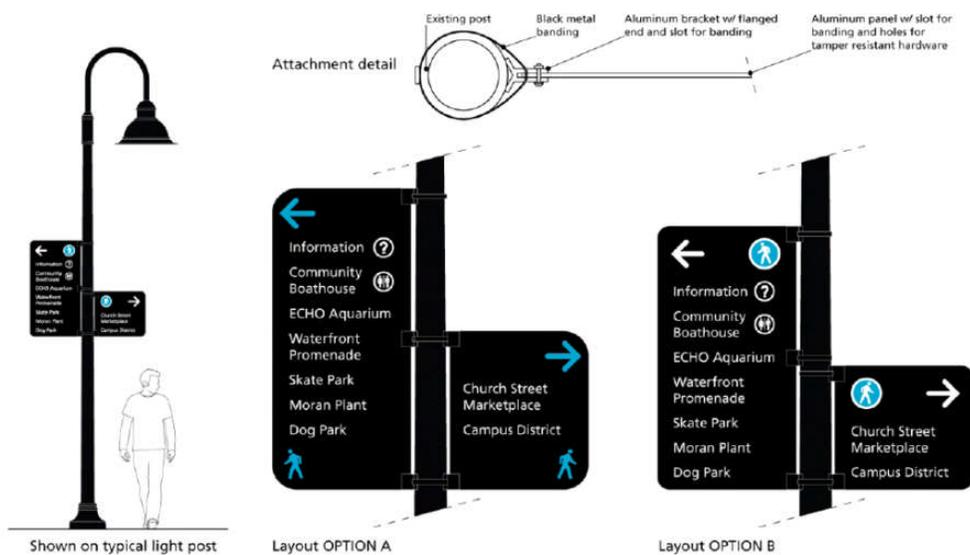
One of the primary targets for the Wayfinding Plan was parking garage identification and information. As shown in Figure 17, signs could incorporate real-time information. Figure 18 shows that real-time data can be applied to LED arrows to indicate to drivers the direction of available parking, rather than getting to a parking garage and finding it full and having to circulate looking for parking. Figure 19 shows the application of the signs.

Figure 19: Parking Garage Signage (Wayfinding Plan Presentation, page 22)



A pedestrian wayfinding system was also a top priority (Figure 20).

Figure 20: Pedestrian Wayfinding (Wayfinding Plan Presentation, page 19)



2.3 Status of Projects Identified in the Reviewed Documents

Some of the ideas identified by documents reviewed for this Synthesis are currently in development or under consideration. Table 4 summarizes the status of these projects.

Table 4: Summary of Project Status

| Type | Project | Status |
|---|--|--|
| Regulatory | Changing the number of parking spaces required by the zoning ordinance from a minimum to a maximum | Section 8.1.9 of the Ordinance establishes a maximum (125% of the minimum required for the Neighborhood Parking District). |
| | Changing zoning parking requirements to allow impact fees or payment-in-lieu options | Under discussion |
| Organizational | Downtown Transportation Management Association | Under discussion for City employees |
| | Develop carsharing | Complete: CarShare Vermont |
| Infrastructure | Wayfinding improvements, including 'smart signs' | Hairpin signs (some with 'smart sign' components) are being installed/replaced |
| | Parking meter upgrade: replace existing parking meters in high demand areas with variable pricing meters that accept credit cards | Bid documents being prepared |
| | Multimodal Transportation Center | Sites are being evaluated |
| | Transit improvements | |
| | - Smaller vehicles operating on residential streets. | In planning |
| | - Energy-efficient vehicles that are quiet and clean. | Bus procurement in planning |
| | - Shorter headways between major destinations. | In planning |
| | - Longer service hours to serve off-shift workers. | In planning |
| | - Clean, informative, and safe shelters. | New shelters are being installed |
| | - Explore alternative funding sources and programming techniques for CCTA. | identified as an action item in the 2010 CCTA Transit Development Plan |
| | South End Transit Center | Identified in 2011 Chittenden County Park-and-Ride & Intercept Facility Plan; Phase 1 in development |
| | Exit 14 Intercept Lot | Identified in 2011 Chittenden County Park-and-Ride & Intercept Facility Plan; project is being scoped |
| | Reintroduction of passenger rail | Regional discussion |
| | Pedestrian alignments from Battery Street to the Waterfront, extending from Sherman Street, Battery Park, Pearl Street, midblock between Pearl and Cherry, and Cherry Street | Sherman Street staircase extension to Moran Plant and bicycle/pedestrian improvements to Depot Street are in design; extensions from other points involve traversing private property and are therefore considered long-term alternatives. Funicular and in-slope parking are under consideration as long-term alternatives. |
| | North-south transit on Waterfront | Long-term alternatives under discussion |
| | Potential for parking garage northeast of railyard, behind Maglianeros and VT Wine Merchants | Address in future planning of Waterfront South |
| | Southern Connector | Final permitting stage; construction could begin by 2013. |
| | Bicycle connection to Winooski | Main Street Bridge currently being assessed |
| | Implementation of North-South Bicycle Plan | Phased implementation under development |
| | Charge for Waterfront parking throughout the year rather than only seasonally | In progress, dependent on parking meter upgrade (see above) |
| Expand residential permit program to address on-street spaces in neighborhoods; sell a limited number of non-residential permits for daily parking. | Under consideration, needs planning | |
| Signal timing improvements and hardware upgrades to Battery Street to improve pedestrian access to Waterfront | In capital work plan | |
| Lake Champlain Transportation Company/Pecor Property-concept for hotel/conference center, marina, and significant amount of parking | Conceptual planning | |
| Re-alignment of northern Lake Street and the bike path, including pedestrian amenities, stormwater improvements, undergrounding of utilities, street lighting, landscaping, and parking, which will support adjacent development opportunities. | In design | |

3.0 CIRCULATION

This section provides an overview of existing and future circulation conditions, including street design guidelines, transit and carsharing, traffic volumes, and bicycle and pedestrian circulation.

3.1 Existing Circulation

This section summarizes circulation highlights from the complete Existing Conditions Assessment (Appendix B).

As detailed in Figure 15, on Page 7 above, the Burlington Transportation Plan sets forth a system of Complete, Transit, Bicycle, Slow, and Pedestrian Streets for the City, along with recommended Street Design Guidelines. Within the PlanBTV study area, the majority of the streets are “Slow Streets,” while Battery St. and Winooski Ave are “Complete Streets” that include transit, bicycles, and pedestrians. Pearl, Main, and St. Paul Streets are to be “Transit Streets” that prioritize efficient transit movement. The actual extent to which all of the elements contained in the proposed design guidelines can be applied to individual corridors will need to be evaluated on a case-by-case basis to best determine how to accommodate all modes while maintaining efficient circulation.

3.1.1 Arriving in Burlington

Figure 21 shows that the drive alone mode share (according to 2000 Census data for commuting to work) for Burlington is 12% lower than Chittenden County’s. Walking is 10% higher in Burlington and transit use is double that for Chittenden County. Figure 22 shows the proportions of traffic (Average Annual Daily Traffic or AADT) at each of Burlington’s six entry points. US 2/Williston Road is by far the largest gateway, followed by the Winooski Bridge, VT 127 & North Avenue (combined), and US 7/Shelburne Road. These splits differ from CCTA ridership: in Figure 23, the number of riders is shown for all CCTA routes entering at that point on an average weekday. The majority of riders enter Burlington from the northeast gateway at the Winooski Bridge. The North Avenue and US 2/Williston Road routes are the next largest, while ridership from the south is split between Pine Street and Shelburne Road.

Figure 21: Mode Splits (source: 2000 Census)

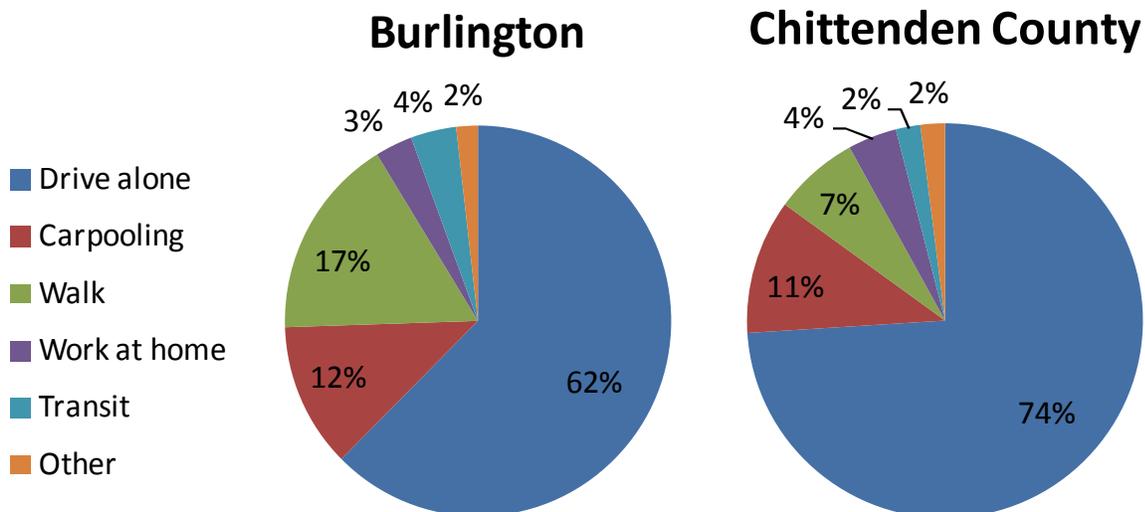


Figure 22: 2007 Traffic Volumes (AADT) for Burlington's Entry Points (source: CCRPC)

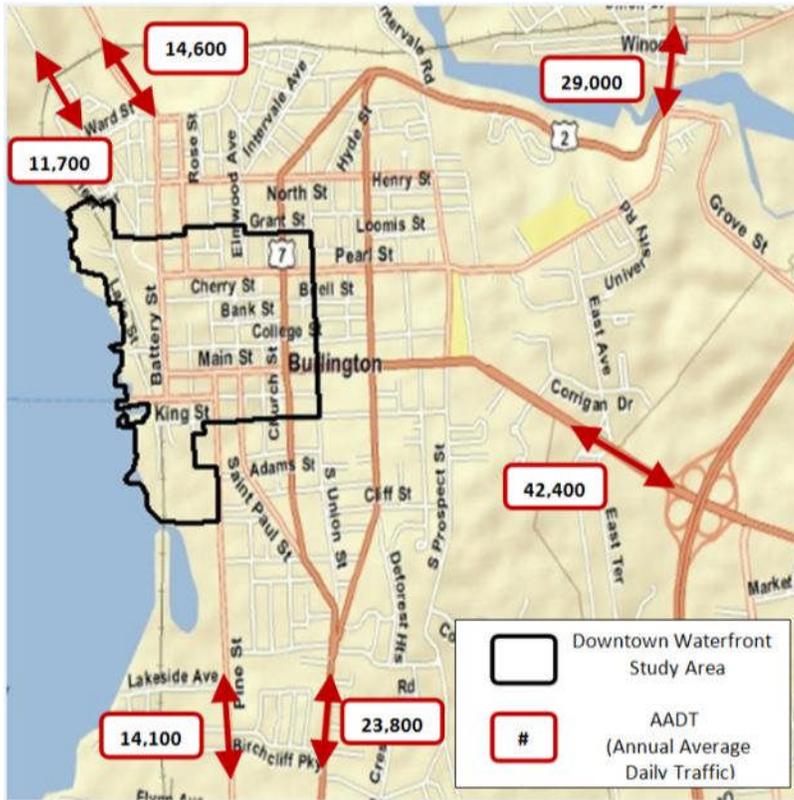
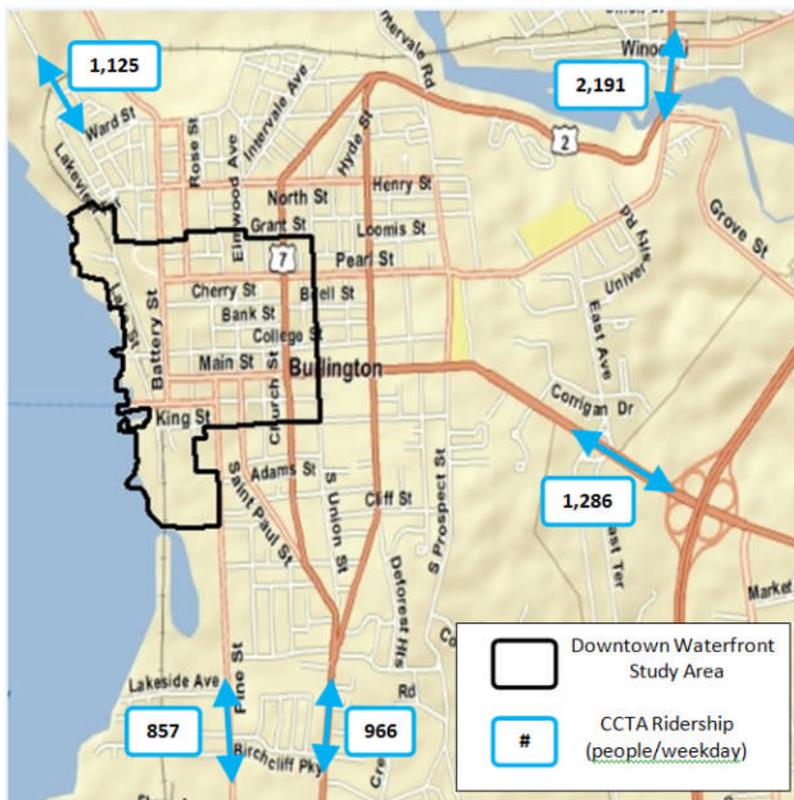
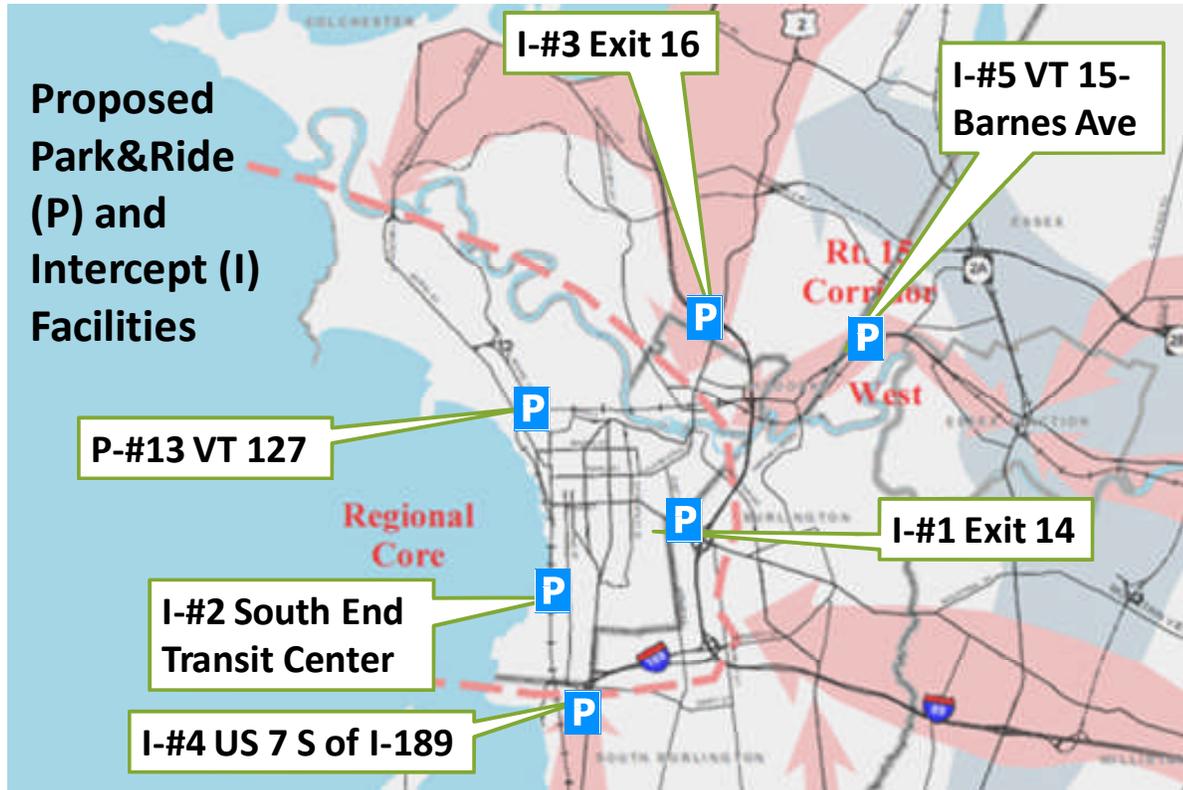


Figure 23: CCTA Average Weekday Ridership by Entry Corridor (source: CCTA 2010 Transit Development Plan)



The 2011 CCRPC Park & Ride Plan proposes park & ride and intercept facilities to create additional off-site parking for Burlington as shown in Figure 24. Some of these facilities (such as Exit 14) would be well-served by shuttle to connect to Downtown. The locations shown here are strategically selected to intercept traffic from the major gateways to Burlington.

Figure 24: Regional Corridors Entering Burlington: 2011 CCRPC Park & Ride Plan Proposals (# is priority assigned by Plan)



3.1.2 Transit

The CCRPC Metropolitan Transportation Plan notes that approximately 40% of peak hour-person trips begin and end in Burlington, South Burlington, and Winooski. Therefore, improving transit service (Figure 25) between these three areas may help to address the high volumes on Main Street, Pearl Street, and Pine Street (Burlington aims to create a “park once” situation for drivers either at the periphery of the City with high-frequency shuttle service into the downtown core for commuters, or within the core itself to serve shoppers and visitors. Figure 26 shows the volumes on the roadways within and approaching the study area: Main and Battery Streets carry the most traffic, followed by Pearl, Pine, and St. Paul Streets and North Avenue. The CCRPC MTP notes that the regional transportation demand model predicts significant congestion by 2025 along most of North Avenue.

Figure 26). Although inter-regional services such as the LINK Express routes are needed and are very successful, focus on shorter, more local transit service has been suggested in previous plans and studies. Past recommendations to improve the transit system have included expanding system convenience, particularly by increasing service hours and frequencies on the major corridors that serve the City: North Ave, Colchester Ave/Pearl Street (VT 15), Williston Road/Main Street (US 2), and Shelburne Road (US 7). Table 5 shows that these routes have the highest ridership in the CCTA system. Looking forward, the College Street Shuttle is repeatedly identified as the model of how transit in Burlington should operate: high-frequency, convenient, user-friendly, and easy to understand.



Additionally, a carsharing organization has started in Burlington, with vehicles located as shown in Figure 25. These vehicles provide an alternative to car ownership by enabling access to vehicles when transit, walking, or bicycling are not feasible trip options. One example of how they can be used is that an employee can take transit to work, but use a carshare vehicle for any necessary trips in the middle of the day, thereby eliminating a roundtrip commute by single occupancy vehicle.

Figure 25: CCTA Transit Service and CarShare Vermont Pods

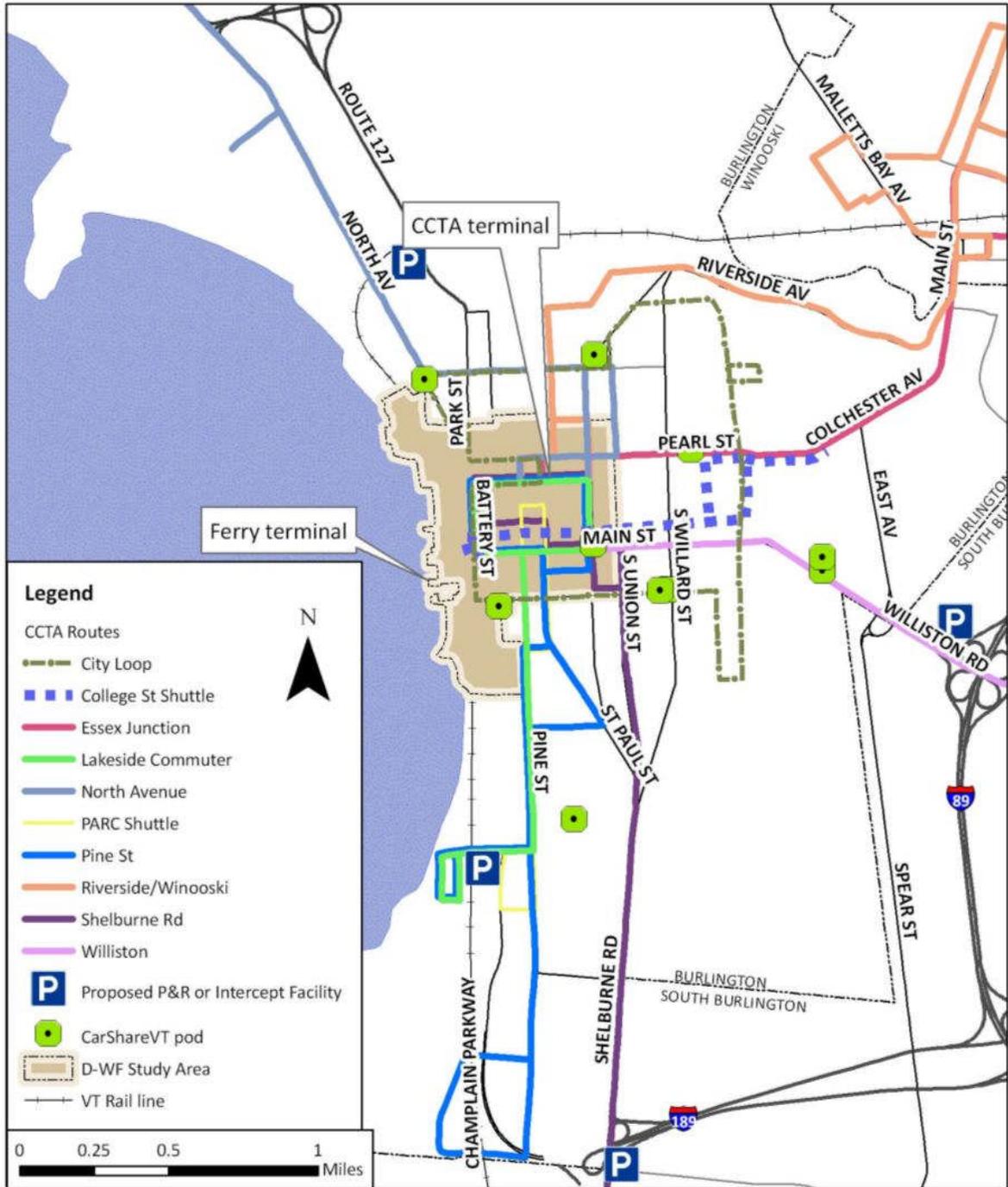


Table 5: CCTA Route Ridership (source: 2010 CCTA Transit Development Plan)

| Bus Route | Average Weekday Ridership |
|----------------------------|---------------------------|
| #1 - Williston | 1,286 |
| #2 - Essex Junction | 1,573 |
| #5 - PineStreet | 439 |
| #6 - Shelburne Road | 876 |
| #7 - North Avenue | 1,125 |
| #8 - City Loop | 346 |
| #9 - Riverside/ Winooski | 501 |
| #11-College Street Shuttle | 702 |
| #13 - PARC Shuttle | 100 |
| #56 - Milton Commuter | 41 |
| #76 - Middlebury LINK | 90 |
| #86 - Montpelier LINK | 295 |
| #96 - St. Albans LINK | 76 |

Based on the Synthesis of Previous Plans and Studies (Section 2.0), two prerequisites to addressing transit service gaps are 1) developing a multimodal transportation center and 2) reforming the transit funding framework to provide the adequate support and resources. The current funding framework is based on property taxes of the towns that are members of CCTA. Reforming this framework so that transit is funded by a dedicated transportation source such as a fuel tax, parking revenues, or driver’s licenses/vehicle registration fees, are alternative funding possibilities.

3.1.3 Single Occupancy Vehicles

Burlington aims to create a “park once” situation for drivers either at the periphery of the City with high-frequency shuttle service into the downtown core for commuters, or within the core itself to serve shoppers and visitors. Figure 26 shows the volumes on the roadways within and approaching the study area: Main and Battery Streets carry the most traffic, followed by

Pearl, Pine, and St. Paul Streets and North Avenue. The CCRPC MTP notes that the regional transportation demand model predicts significant congestion by 2025 along most of North Avenue.

Figure 26: 2007 Average Annual Daily Traffic (AADT)(source: CCRPC)



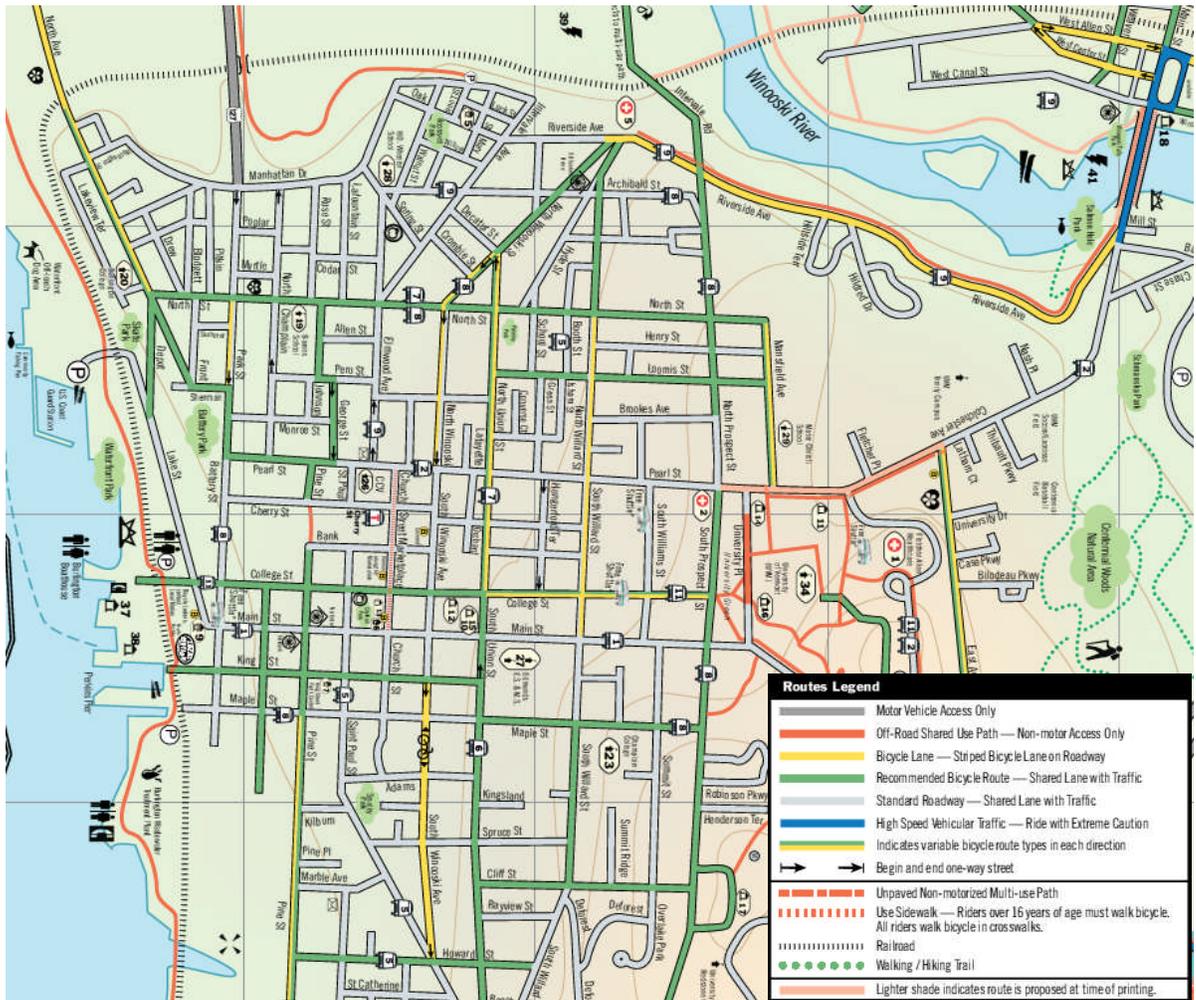
3.1.4 Bicycles and Pedestrians

The Downtown and Waterfront areas are quite walk-able, with a comprehensive system of sidewalks, crosswalks, and pedestrian signals. There are blocks where the streetscape is much more attractive and inviting to pedestrians. For example, it is generally considered that walking past pedestrian-scale storefronts and residences (such as on College Street) is more inviting than continuous stretches of undifferentiated exterior walls in evidence in some downtown locations.

For bicycles, one of the most significant east-west barriers is the hill from the Waterfront to Downtown. In addition, bicycle facilities are mostly north-south rather than east-west.

Bicycle and pedestrian system gaps within the study area (Figure 27) focus more in terms of north-south and (particularly for this study) east-west movement. Streetscape improvements to lower Church Street and St. Paul Street have been constructed in Summer 2011 to expand the pedestrian orientation of the Church Street Marketplace to these adjacent north-south blocks. Improvements to Pearl Street are now under construction to improve parking and bicycle access in particular. While the presence of sidewalks in the study area is comprehensive, the streetscaping needed to *attract* pedestrians to these blocks is lacking.

Figure 27: Bicycle-Pedestrian System



While Battery Street and its western slope have long been identified as the major disconnects between the Downtown and Waterfront, addressing streetscaping and pedestrian wayfinding (in progress along with other City-wide wayfinding improvements) on east-west blocks may be a shorter-term and easier-to-implement improvement to make the Downtown-Waterfront connection. The Waterfront North Scoping Study identified potential alignments for addressing the lack of an east-west connection on the west side of Battery Street:

- Near term: develop a stairway at Sherman St. Stairway and make improvements to Depot Street to enhance its function as a bicycle-pedestrian corridor.
- Longer term: investigate building a parking structure into slope (would include staircase/elevator), stairway streets, and/or a funicular.

Appendix B describes other gaps in the bicycle network, including:

- Champlain, Pine, & St. Paul Streets are all cut off by Burlington Town Center
- Winooski Avenue is difficult for bicyclists
- There is no east-west connection south of Maple Street between Island Line and Pine Street

Burlington has put significant effort into providing bicycle parking, adding them on main roads and bicycle routes, reclaiming on-street parking spaces for large, artistic bicycle racks, and locating them near the bike path, in parking garages and surface lots, and other popular destinations.

3.2 Future Circulation

The future circulation analysis component of this study has been performed using the Chittenden County Travel Demand Model. This model represents daily traffic (AADT) and has been calibrated to 2005 traffic conditions. RSG has developed this model for the CCMPO. The CCMPO uses this model for a variety of transportation planning purposes, including for projecting future year land use and transportation activity.

For the PlanBTV Transportation Study, the CCMPO model was run to 2040, assuming 1% annual growth in the region's population and employment. From this "CCMPO 2040 Base Case", a new "Burlington Downtown-Waterfront 2040 Base Case" was developed for this analysis incorporating specific future growth within the study area provided by the Department of Planning and Zoning. The purpose was to test the impact on congestion of achieving a more favorable ratio of jobs to housing.

The model was run using the new Burlington Downtown-Waterfront 2040 land use to obtain traffic volumes and volume-to-capacity ratios for six arterial roadways¹:

1. VT127
2. North Avenue
3. US7/Shelburne Road
4. Pine Street
5. Main Street/US2
6. Colchester Avenue/Riverside Avenue

Figure 28 shows the source (or origin) of external traffic destined for locations within the study area.

¹ Note that the v/c ratios reported are for roadway segments and not for intersections. Intersection v/c ratios are generally higher than roadway segment v/c ratios due to the presence of conflicting traffic. The roadway segment v/c ratios are best understood in comparison across the 3 alternative scenarios.



Figure 28: Source of External Traffic Destined for the Study Area¹

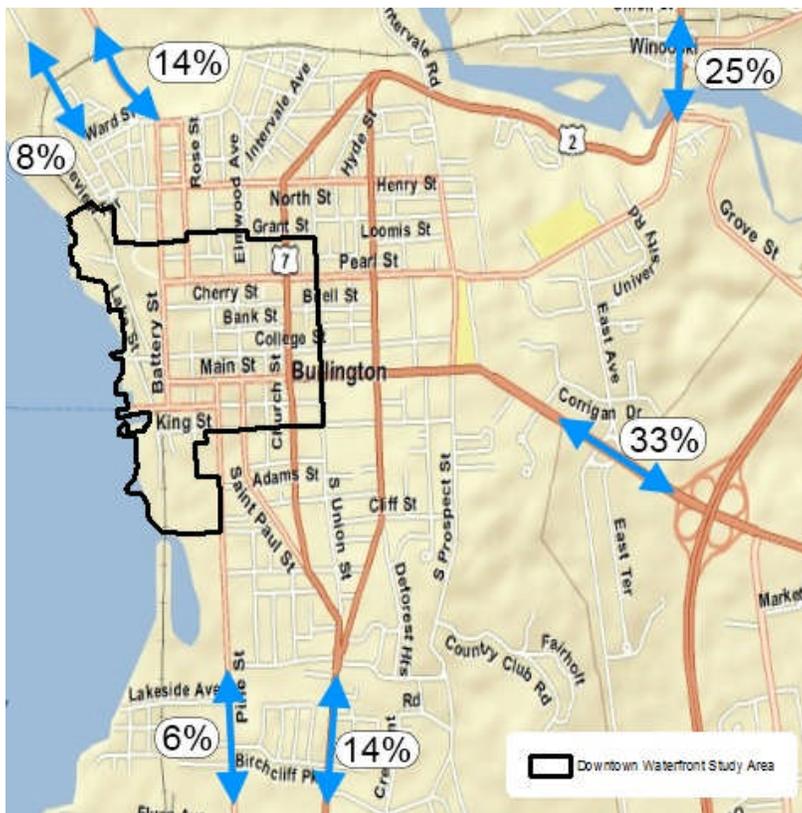


Table 6 summarizes the jobs and households located within the study area for each of the two model scenarios. For comparison purposes, the land uses assumed by the 2010 and 2040 CCMPO models are provided. Note that Scenario 1, which models higher CCTA bus frequency and implementation of the three intercept parking facilities, uses the 2040 BDW Base land use assumptions.

Table 6: Land Use Assumptions from the CCMPO Travel Demand Model for the Downtown-Waterfront Study Area

| | Jobs | Households | Jobs per household |
|---------------------|-------------|-------------------|---------------------------|
| 2010 CCMPO | 12,959 | 2,535 | 5.11 |
| 2040 CCMPO | 14,579 | 3,502 | 4.16 |
| 2040 BDW Base | 19,780 | 4,225 | 4.68 |
| 2040 BDW 'Balanced' | 14,579 | 4,858 | 3.00 |

The two scenarios that the circulation model was run to test are as follows:

1. **Scenario 1** includes three Park and Ride lots (Exit 14—1200 spaces, Exit 16—800 spaces, South End Transit Center—1000 spaces) as recommended in the 2011 CCMPO Park&Ride Plan. This scenario also includes increasing CCTA service frequencies to 15 minutes for the six routes serving the study area.
2. **Scenario 2** models a “balanced” land use scenario within the core study area, seeking to increase the amount of housing relative to jobs, as consistent with the Burlington Legacy vision. It includes the elements of Scenario 1 as well.

¹ Data in Figure 28 are from the CCMPO Travel Demand Model and represent projected 2040 travel conditions.



The amount of new housing depicted in the 2040 BDW “Balanced” scenario represents a 91% increase in housing within the study area. This points to the need for substantially increasing allowable residential densities within the study area to achieve the land use vision expressed in the Burlington Legacy project. Specific zoning amendments will be necessary to facilitate increased residential densities. For this to be achieved the City will need to eliminate the limit set forth in Section 4.4.1 (d) 1.B. of the Comprehensive Development Ordinance which restricts residential use in the Downtown and Downtown Waterfront Districts to 50% of the gross floor area of a site.

Table 7 and Table 8 show the travel results for the 2040 Base Case and for the two Scenarios, for the AM and PM peak hours respectively (a comparison to existing 2010 conditions is provided in Appendix C). “v/c” or volume-to-capacity ratios compare roadway volumes to the amount of traffic that the roadway can handle (capacity); it is basically a measure of how much of the roadway is being used.

Table 7: AM Peak Hour Results for the 2040 Base, Scenario 1 (Intercept Lots) and Scenario 2 (Balanced Land Use)

| AM Peak Hour Two-Way Link Volume. | | | | | | |
|-----------------------------------|----------|---------------|-----------|------------|---------------|----------|
| Scenario | Pine St. | Shelburne Rd. | Route 127 | North Ave. | Williston Rd. | Main St. |
| Base | 600 | 1300 | 1300 | 700 | 3500 | 2500 |
| Intercept Lots | 500 | 1200 | 1300 | 700 | 3200 | 2400 |
| Balanced | 500 | 1200 | 1100 | 700 | 3100 | 2300 |

| AM Peak Hour v/c Ratio for Peak Direction. | | | | | | |
|--|----------|---------------|-----------|------------|--------------|---------|
| Scenario | Pine St. | Shelburne Rd. | Route 127 | North Ave. | Williston Rd | Main St |
| Base | 0.25 | 0.27 | 0.50 | 0.47 | 0.42 | 0.43 |
| Intercept lots | 0.27 | 0.23 | 0.47 | 0.44 | 0.36 | 0.39 |
| Balanced | 0.28 | 0.21 | 0.40 | 0.46 | 0.34 | 0.40 |

Table 8: PM Peak Hour Results for the 2040 Base, Scenario 1 (Intercept Lots) and Scenario 2 (Balanced Land Use)

| PM Peak Hour Two-Way Link Volume. | | | | | | |
|-----------------------------------|----------|---------------|-----------|------------|--------------|---------|
| Scenario | Pine St. | Shelburne Rd. | Route 127 | North Ave. | Williston Rd | Main St |
| Base | 800 | 1800 | 1800 | 1000 | 4200 | 3200 |
| Intercept Lots | 700 | 1700 | 1800 | 1000 | 4000 | 3000 |
| Balanced | 600 | 1600 | 1700 | 900 | 3900 | 3000 |

| PM Peak Hour v/c Ratio for Peak Direction. | | | | | | |
|--|----------|---------------|-----------|------------|--------------|---------|
| Scenario | Pine St. | Shelburne Rd. | Route 127 | North Ave. | Williston Rd | Main St |
| Base | 0.38 | 0.30 | 0.70 | 0.52 | 0.48 | 0.55 |
| Intercept lots | 0.30 | 0.28 | 0.67 | 0.51 | 0.43 | 0.51 |
| Balanced | 0.31 | 0.28 | 0.62 | 0.46 | 0.42 | 0.48 |

For both scenarios and for both times of day, arterial link volumes are either equal to or less than the base case. Volume-to-capacity ratios are reduced as a result. Of the two scenarios, the “balanced” land use scenario, which concentrates significantly more residential development within the study area, is more effective at reducing arterial congestion. This point is reinforced by Figure 29 which depicts the downtown Burlington street network and shows the relative change in travel time between the 2040 Base Case and Scenario 1 (left) and Scenario 2 (right). The green highlighting indicates streets where delays are reduced



>10% relative to the base case; red indicates areas where delays are increased >10% relative to the base case; and, no change indicates similar travel time performance between the base case and the scenario.

These figures indicate that both scenarios are effective at relieving congestion in the study area, but that Scenario 2 is significantly more effective since a much larger amount of trip making can be made with non-automobile modes due to the higher concentration of residents in the downtown.

Figure 29: Comparison of 2040 Base Case Travel Times with Scenario 1 and Scenario 2 Travel Times



This is a compelling result that supports the Burlington Legacy Vision and reinforces the transportation benefits of encouraging housing investment within the study area. Other initiatives within this project point to parking policies designed to encourage investment in downtown housing. Combined – the lower parking requirements and the positive travel time results – show that policies to encourage housing development in the downtown are synergistic.

In addition to these results, it is worthwhile to note that the analysis conducted for the Waterfront South Access Project indicated that all the variations of the proposed grid street network south of Maple Street and west of Pine Street outperformed the base case (no-build), particularly in regard to traffic operations at the Pine/Maple intersection.

4.0 PARKING

In Burlington, the Department of Public Works manages the public parking supply, including parking meters and revenue collection. Public Works subcontracts enforcement to the Police Department. In 1999, the City established a Downtown Improvement District (which is roughly encompassed by this study area). An annual tax levied on nonresidential properties within the District funds a parking program which provides two hours of free parking in any designated municipally or privately owned or operated off-street parking facility within the District.

This section describes user groups and how they might utilize the parking supply, existing conditions, and future conditions.



4.1 User Groups

To determine effective improvements to the transportation system, the users and their needs must first be understood. Table 9 summarizes some of these groups in the Downtown and Waterfront areas and the differences in their parking and transportation demands. For example, if customers need daytime parking but residents only require overnight parking, both user groups can use the same parking facility. Opportunities such as this are called “temporal sharing.” The headings “Priority,” “Convenience,” and “Easy to Find” were assigned a scale of 1 to 3 to provide an overall sense of types of facilities to match with users. User groups with a priority of 1 park for the shortest duration and therefore need parking for quick access, while it is more acceptable for longer duration parkers to park in less convenient places. Easy-to-find reflects the expected users’ familiarity with the area and how important it is for them to be able to find a space quickly and easily. Users with a rating of 2 in this category are expected to be more familiar with Burlington and its parking options.

Table 9: User Groups in the Study Area

| User Group | Priority | Parking Preference | Times Needed | Duration | Convenience | Easy to Find | Potential Arrangements to Maximize Utilization |
|--|----------|--|--------------------------------|------------------|-------------|--------------|--|
| Employees-office | 3 | On-site; covered; remote with incentives | Weekdays 8AM to 6PM | 8+ hours | 3 | 2 | Off-site served with shuttle; near-site facilities temporally shared with neighbors; limited on-site parking |
| Employees-retail | 3 | On-site; covered; remote with incentives | 8AM to 9PM; 7 days/week | 8+ hours | 3 | 2 | Off-site served with shuttle; near-site facilities temporally shared with neighbors; limited on-site parking |
| Residents | 3 | On-site; covered; remote with incentives | Weekdays 6PM to 10AM, weekends | 8+ hours | 3 | 2 | Off-site served with shuttle; near-site facilities temporally shared with neighbors; on-site loading/unloading zones |
| Short-term visitors/clients (e.g. ~2 hours for meetings, errands, meals) | 2 | On-site, on-street | All times, 2-hours | ~2 hours | 1 | 1 | On-site; on-street; publicly accessible garages and lots |
| Visitors (half to full day) | 2 | On-street, garage, lot | Weekends | half to full day | 2 | 1 | Off-site served with shuttle; on-street; publicly accessible garages and lots |
| Deliveries | 1 | On-street, lot | Weekdays 8AM to 6PM | ~15 minutes | 1 | 1 | Continue on-street loading zones |
| ADA access | 1 | On-site, on-street | All-times | Any | 1 | 1 | Continue to designate spaces per ADA specifications |

The Bureau of Labor Statistics Consumer Expenditure Survey provides data on vehicle ownership and shows that renters are less likely than homeowners to own at least one vehicle (Figure 30). This suggests that different strategies for managing resident parking demands are possible, such as unbundling parking from lease agreements and reducing ordinance parking requirements for apartment buildings. The Survey also indicates that vehicle ownership varies with income, as shown in Table 10. This information can be useful when determining parking requirements for different housing markets.

Regardless of user group, parking needs to be safe and clean for all.



Figure 30: 2008-2009 Consumer Expenditure Survey Average Annual Expenditures and Characteristics: Vehicle Ownership

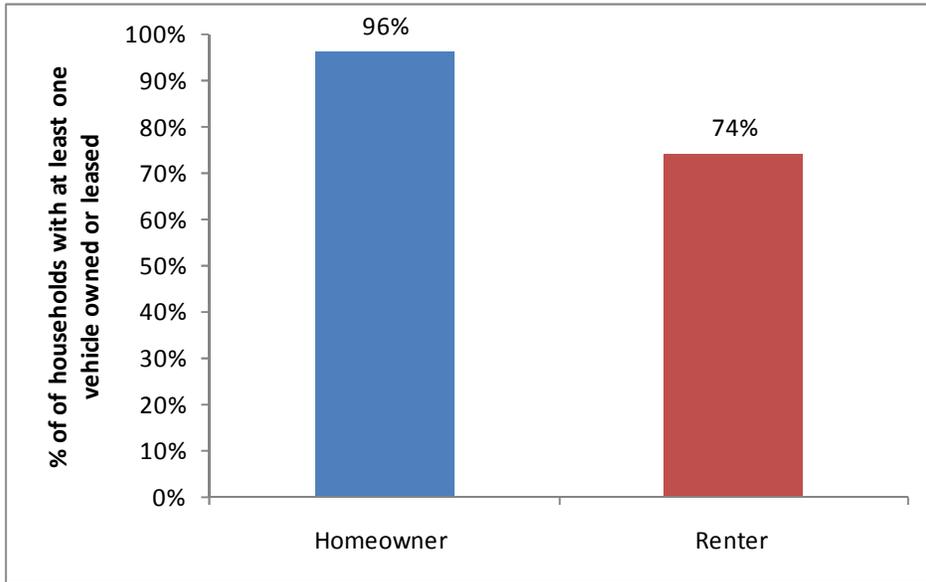


Table 10: Consumer Expenditure Survey: Vehicle Ownership by Income Level (2008-2009, Northeastern Region)

| Income Level | Vehicle Ownership |
|----------------------|-------------------|
| \$19,999 or less | 38-64% |
| \$20,000 to \$69,999 | 75-90% |
| \$70,000 or more | 95% |

4.2 Existing Parking Conditions

This section summarizes parking capacity and operations, occupancy, and ownership and use.

In 1996 RSG surveyed Downtown visitors at Burlington Town Center to understand their circulation patterns.¹ The study found that after parking their car, visitors typically walked to three different destinations, compared to the one trip per parked vehicle that would be found in more suburban, single mode areas. Increasing this 3 trips/parked vehicle result is in line with the goal identified in Section 2.0 of increasing parking efficiency; a strategy of encouraging people to “park once” would reduce the congestion associated with hunting for a parking space.

A June 2011 study on City employee commutes identified the lack of an organized “home” for transportation demand management programs as a barrier to increasing the use of alternative transportation. Similarly, the 2008 Downtown Burlington Employee Transportation Survey Report indicated that expanding incentives and raising awareness of alternative transportation options is needed. An opportunity exists to reduce transportation and parking demand by organizing and administering such programs for employers in the study area. Maintaining flexibility for users is critical to reducing transportation and parking demand: not only would participation be low in such programs if they do not accommodate daily schedule changes and needs, but the effectiveness of shifting modes will not be realized. Telecommuting options, CarShare Vermont memberships, occasional use parking permits, CCTA passes, access to bicycles, and a guaranteed ride home program are elements of building a flexible menu of options for commuters.

¹ 12/19/1996 RSG intercept survey at Burlington Square Mall (now Burlington Town Center).



4.2.1 Parking Capacity and Operations

As shown in Figure 31, there are 8,846 parking spaces within the study area. Figure 32 compares the footprint of the 3,940 spaces (8.33 acres) in structures to the 3,342 spaces (27.34 acres) in surface lots. Parking structures are generally expected to have a 50-year lifespan. Appendix D summarizes the results of a preliminary visual assessment of the conditions of the City's three garages. The Marketplace garage was constructed in 1976, the College Street garage in 1985, and the Lakeview garage in 2000.

Figure 33 shows the costs to park on-street along various blocks in the study area. Detailed parking costs are presented in Appendix D. The majority of parking (not including leased or monthly permit parking) costs an average of \$1/hour; three facilities charge somewhat more or less. Figure 34 shows that no correlation could be established between parking costs and occupancies; that is, less expensive facilities were not more occupied than more expensive ones.

Figure 32: Structures and Surface Lots

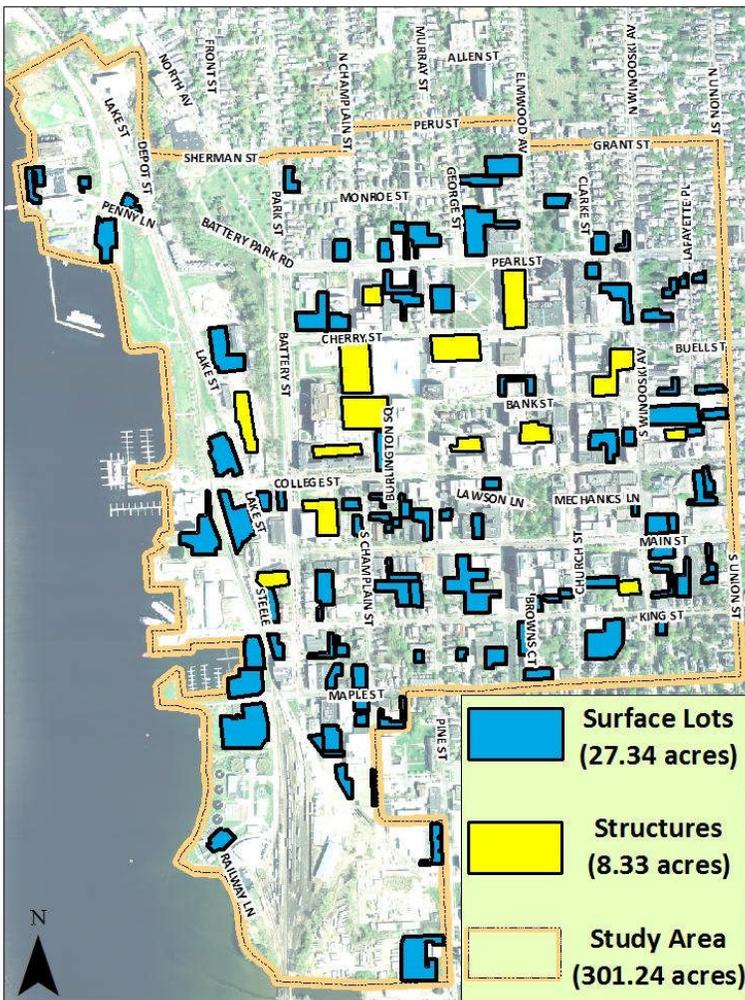


Figure 31: Parking Capacity in the Study Area by Type

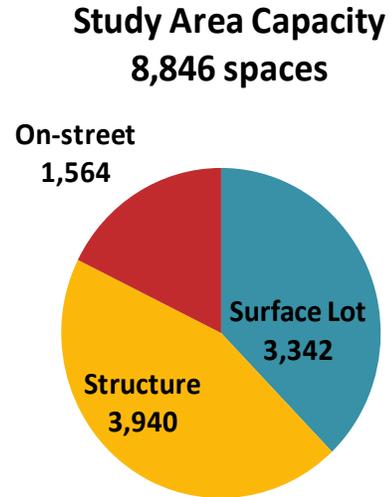


Figure 33: On-Street Parking Meter Costs

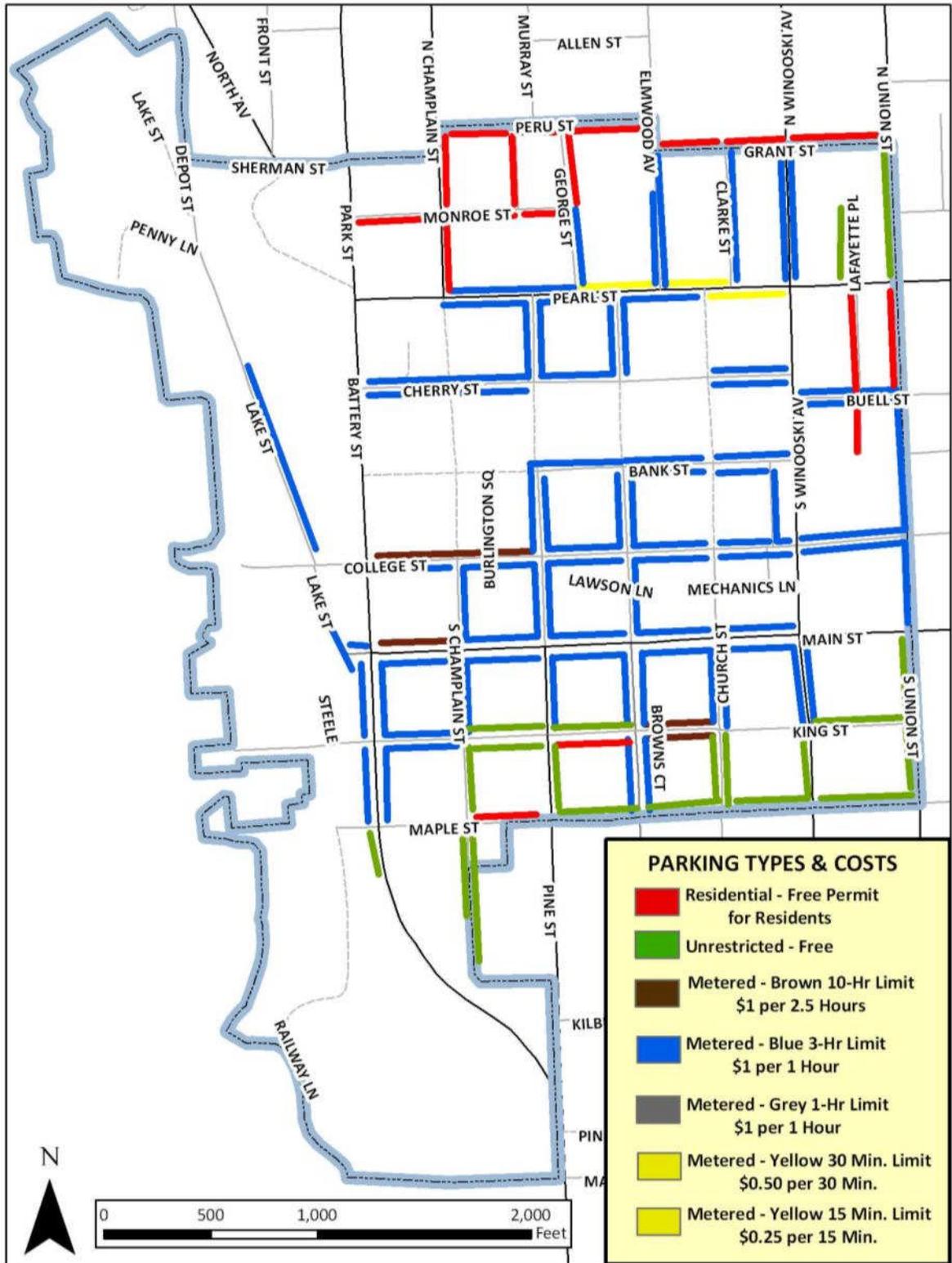
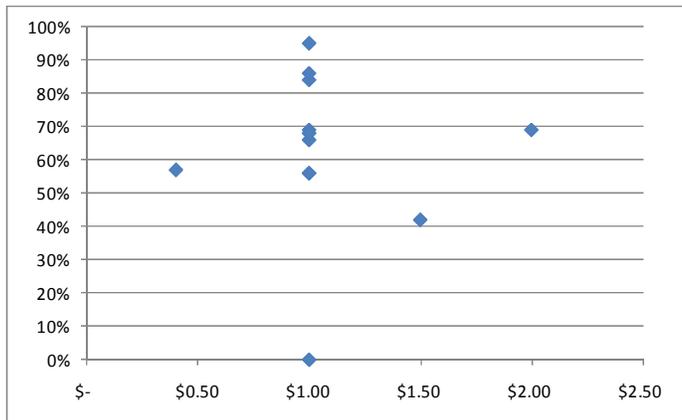


Figure 34: Occupancy versus Parking Costs in Hourly/Metered Surface Lots and Structures



Burlington’s parking revenue funds many non-parking programs. The Department of Public Works Traffic Division provided information as to the amounts and sources of revenue (Figure 35, totaling approximately \$8.3M) and the programs that they in turn fund (Figure 36, totaling approximately \$8.3M). Additional detail about these programs is provided below:

- Meters & Metered Lot Program: collection, meter maintenance & repairs, surface lot maintenance
- Meter Enforcement by Police Department
- Signage Program (Regulatory & Directional): responsible for all street name signs, all roadway regulatory signs, & parking signs
- Pavement Marking Program: responsible for all stop bars, crosswalks, parking space delineation, & long line road striping
- Flower Planting Program: plantings at traffic islands, lots, etc.
- Traffic Signal System Operations
- School Crossing Guard Program
- Operation of three downtown parking garages: operation, maintenance, capital and debt expenses
- Operating Expenses-Airport Facility
- Direct Revenue Payment to Airport

If parking were self-funded (and the airport facility were removed from the picture), it would have a surplus of \$780,000 to pay for parking improvements (Table 11). However, programs such as the signage, flower planting, and school crossing guard programs would need to find other funding sources.

53 spaces are leased in the City’s Marketplace garage, and a combined total of 890 spaces are leased in the College Street and Lakeview garages; these leased spaces contribute \$985,000 to the total revenue earned by the Downtown Parking Garages (\$1,940,000). The Downtown Improvement District contributes \$270,000 to this total to pay for the 2-hour free parking program. Although the Lakeview garage generates the most revenue of the three garages (approximately \$825,000), this is due to its 678 space capacity (generating about \$1,200/space). The Marketplace garage generates approximately \$675,000 with its 401 spaces (~\$1,700/space) and the 460-space College Street garage generates about \$500,000, or \$1,100/space.



Figure 35: Sources of Parking Revenue

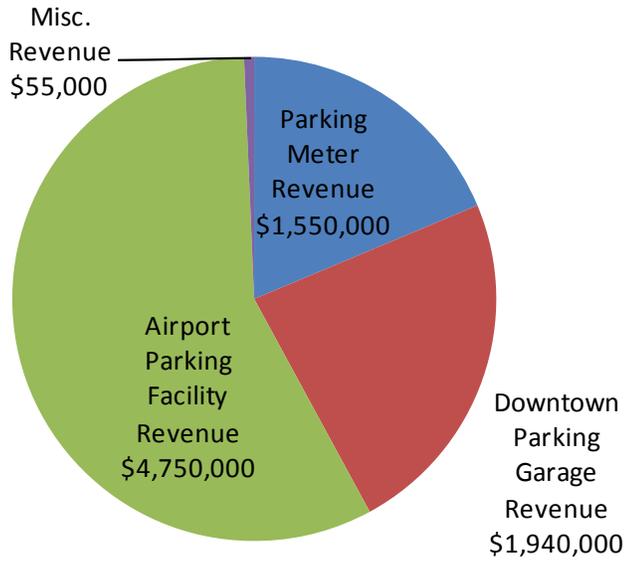


Figure 36: Parking Program Expenditures

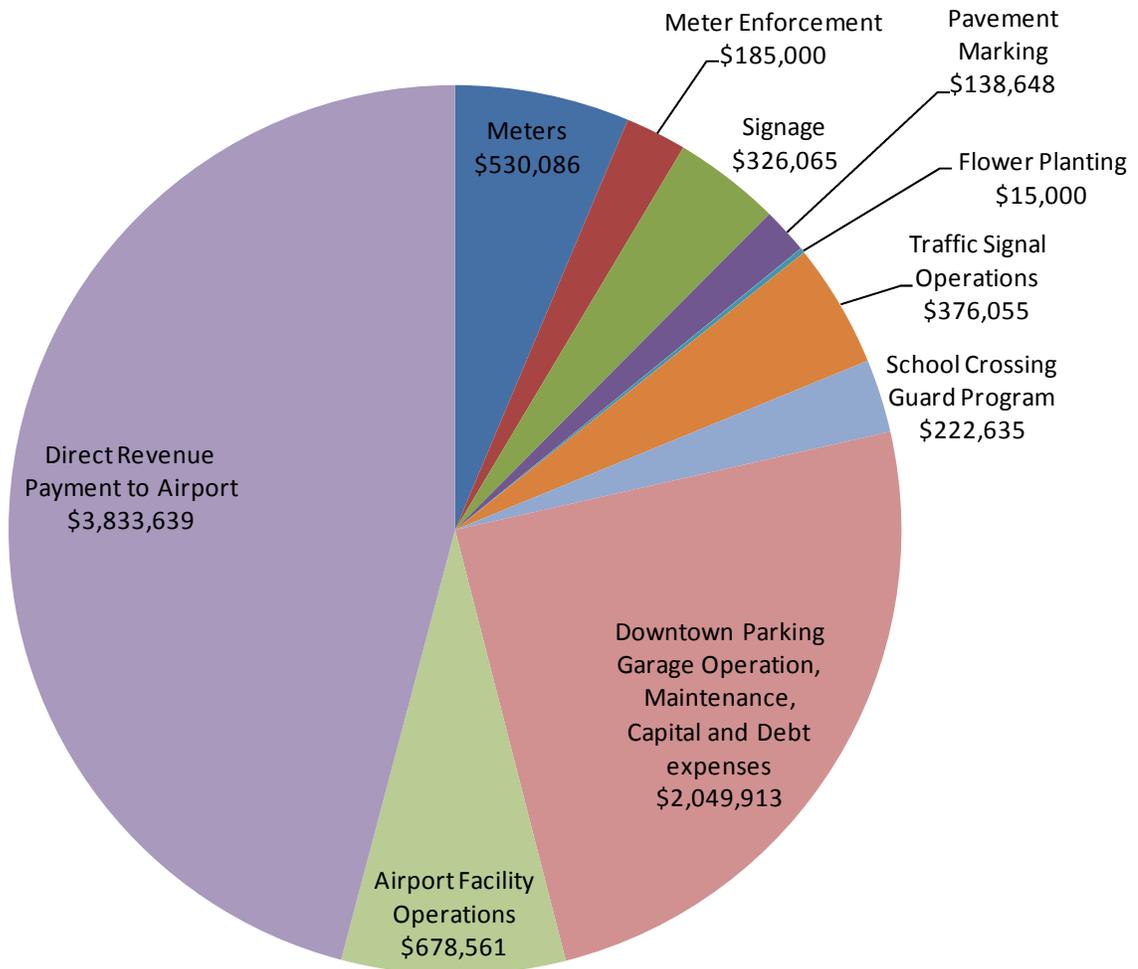


Table 11: Burlington Parking Revenue, Expenditures, and Net Difference

| Revenue | | Expenditures | | Difference |
|---------------------------------|-------------|--|-------------|------------------|
| Parking Meter Revenue | \$1,550,000 | Meters | \$530,086 | |
| Downtown Parking Garage Revenue | \$1,940,000 | Meter Enforcement | \$185,000 | |
| Misc. Revenue | \$55,000 | Downtown Parking Garage Operation, Maintenance, Capital and Debt expenses | \$2,049,913 | |
| Total \$3,545,000 | | Total \$2,764,999 | | \$780,001 |

4.2.2 Occupancy

Parking counts were performed in summer 2011 following the methodology of the 2003 Downtown Burlington Parking Study. The counts confirmed that the peak parking occupancy occurs between 1:00 and 3:00PM on Friday afternoon, when it is likely that weekend visitors are entering Burlington and overlapping with downtown employees who are still at work.

An occupancy of 85% is suggested as the level at which parking supply is used most efficiently because parking spaces are being used but there are still enough spaces empty to allow for turnover.¹ As shown in Figure 37, the total occupancy of the study area during the peak period was 65%, well below the 85% optimum. However, there are specific facilities and locations within the study area that are used more than others. Figure 38 shows the overall parking occupancies of the study area zones. In general, on-street parking is used more intensively than in structures (Figure 39) and parking in Zones 2, 3, 4, and 9 are the most highly utilized. The data are generally consistent with the patterns identified in the 2003 parking study, except that occupancies in 2011 were slightly lower.

Figure 40 shows that on-street spaces are more occupied than garages and lots in Zones 2, 3, 4, and 9. This, combined with the highly visible conflicts that develop when the Marketplace garage (Zone 2) fills up, creates a strong perception that there is a shortage of parking. However, there are 988 empty parking spaces in the lots and structures of these zones at the same time;² 429 of these empty spaces are in Zone 2. Empty spaces are distributed throughout the zones (as opposed to a few specific facilities that are underutilized); however, since many are restricted to private property users and/or are difficult to find, they are underutilized.

This analysis suggests an opportunity for shifting parking demand to underutilized facilities such as the Lakeview garage (66% occupied), through improved user information (advertising 2-hours free parking in garages, as well as smart signs indicating available spaces three blocks away) and/or pricing (for example, installing parking meters with variable pricing technology to charge more during the peak period for parking adjacent to the Marketplace compared to a block or two away).

¹ Donald Shoup (2005), *The High Cost of Free Parking*, Planners Press (www.planning.org).

² This includes empty spaces in privately owned facilities that are only available to that property's affiliates. Shared parking arrangements, which would allow more people to use these facilities, would make more efficient use of the existing parking supply.



Figure 37: Total Parking Occupancy in the Study Area during the Friday 1-3PM Peak Period

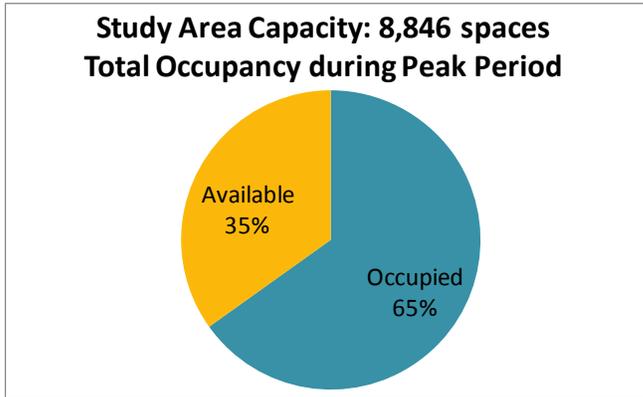


Figure 38: Peak Period Average Occupancy of Parking Zones

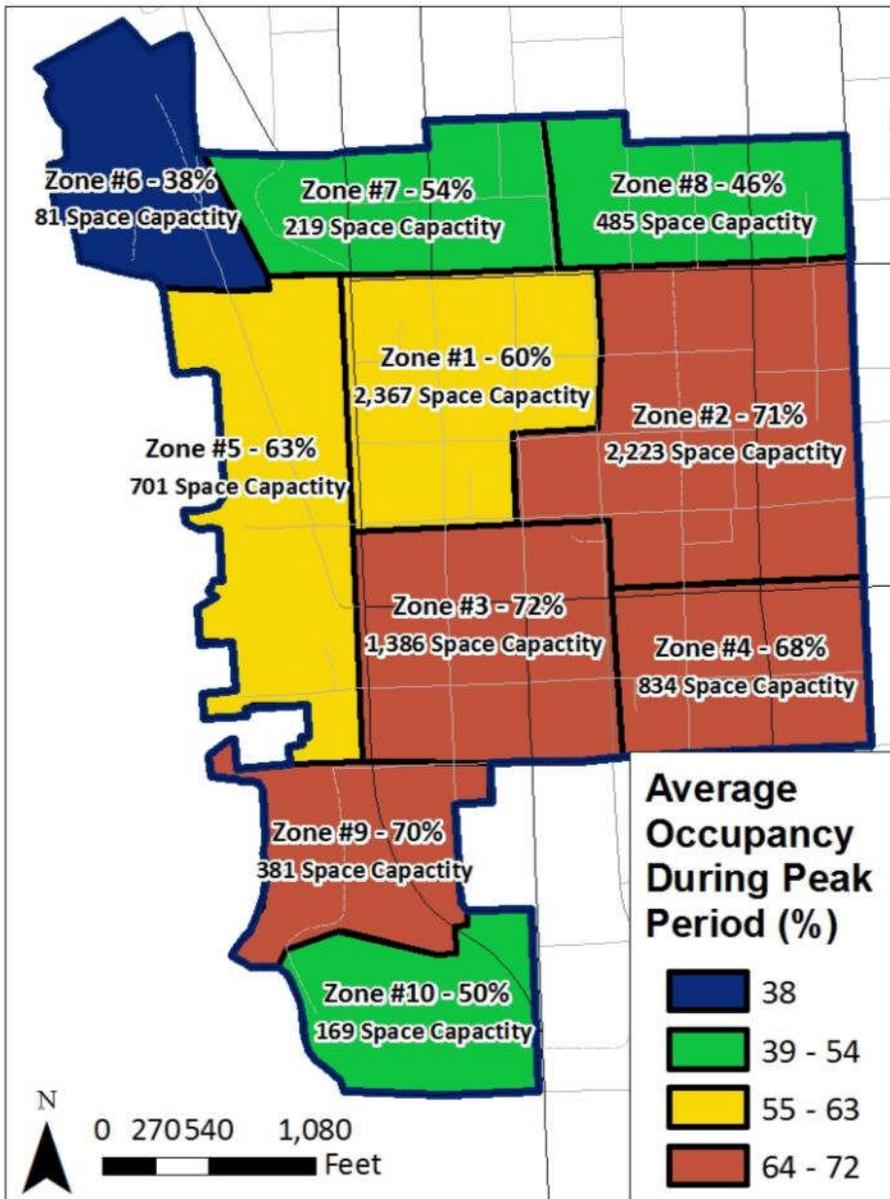
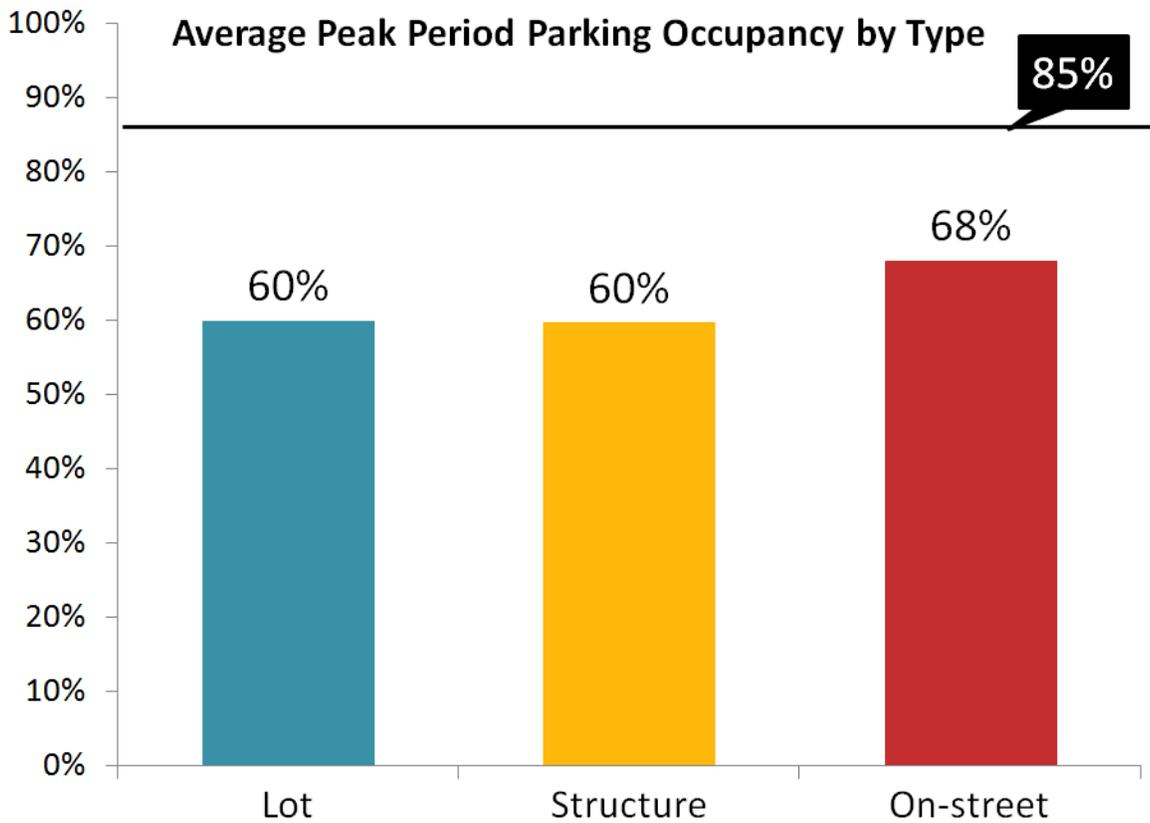
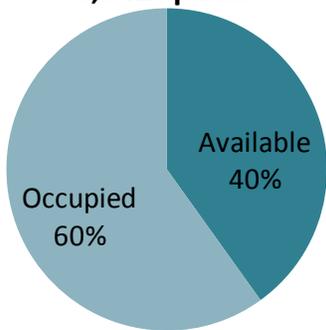


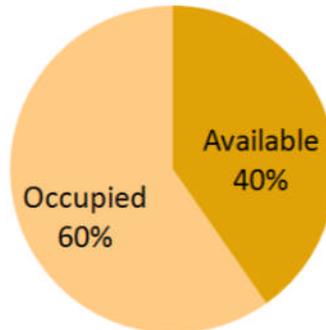
Figure 39: Peak Period Parking Occupancy by Type



Surface Lot Capacity:
3,342 spaces



Structure Capacity:
3,940 spaces



On-Street Capacity:
1,564 spaces

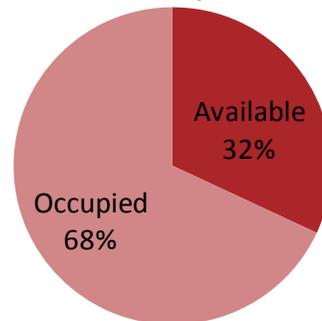
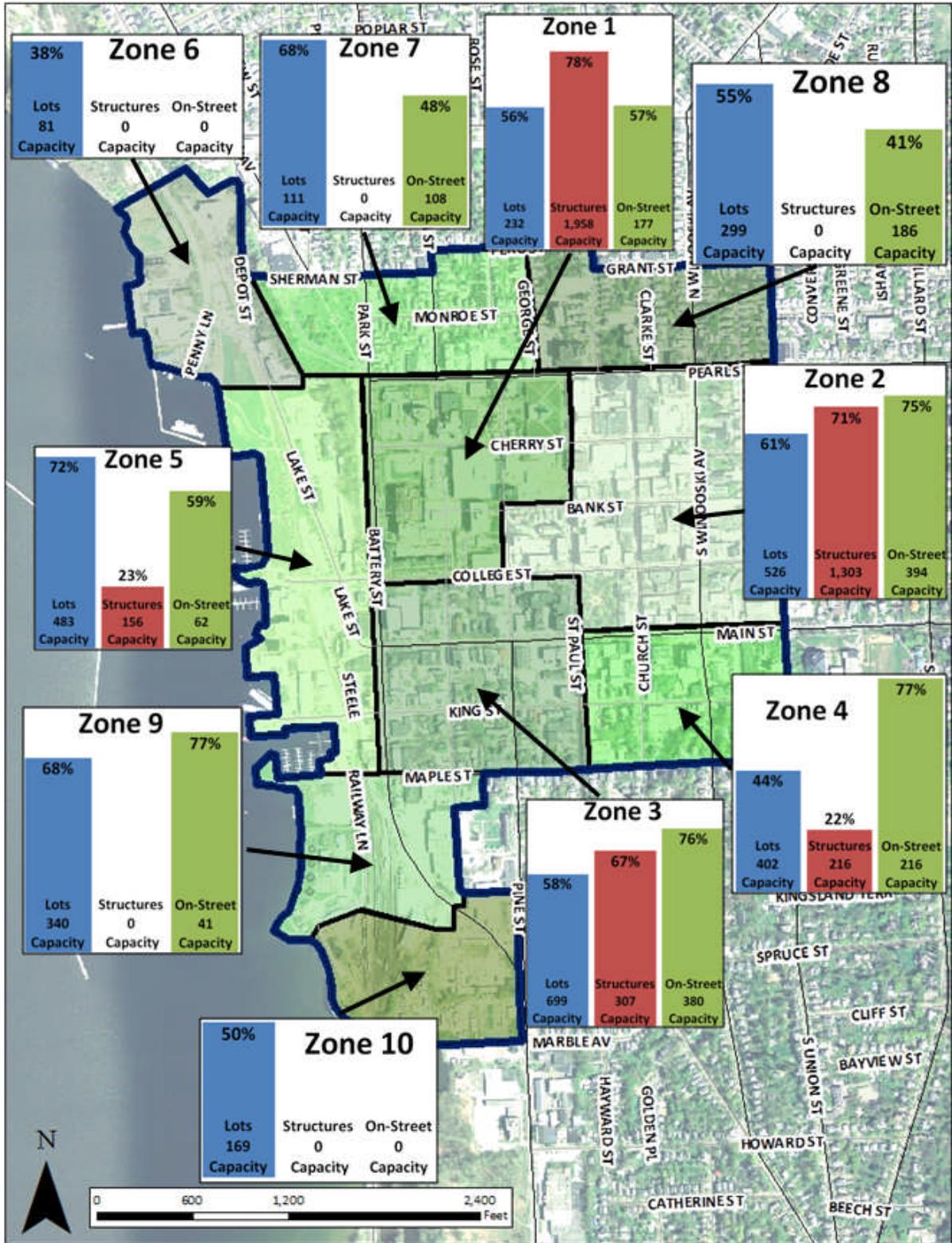


Figure 40: Zone Occupancy by Type of Parking



4.2.3 Facility Ownership and Use

As in the 2003 parking study, facilities were considered in light of ownership and use:

- Public/Public lots and structures are owned by the City and open to the public.
- Private/Private facilities are privately owned and are open only to the owners' clients and/or employees.
- Private/Public lots and structures are privately owned, but open to the general public.

In addition, there are facilities that are Private/Private during business hours, but open to the public at other times. For example, Main Street Landing's surface lot on the Waterfront is permit-only for tenants Monday through Friday until 6PM; at other times the general public can park there for a fee. This example presents a valuable opportunity for sharing parking: efficiency can be improved by sharing parking among uses during off-peak or non-operating hours.

To understand the current trends across ownership/use types, the study area's 7,282 lot and structure spaces (all off-street parking) are considered in Figure 41 and Figure 42. Figure 43 shows that during the peak period, the Private/Private facilities had the lowest occupancy at 60%, while Public/Public lots and structures had the highest occupancy at 71%. Three structures carry the majority of the parking demand as shown in Figure 44. The Marketplace garage was near capacity during the peak period.

Figure 41: Surface Lot and Structure Parking Capacity by Ownership/Use

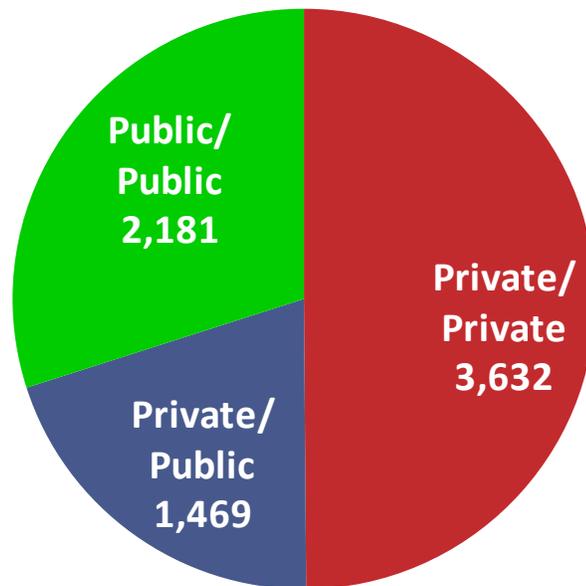


Figure 42: Surface Lots and Structured Parking by Ownership/Use

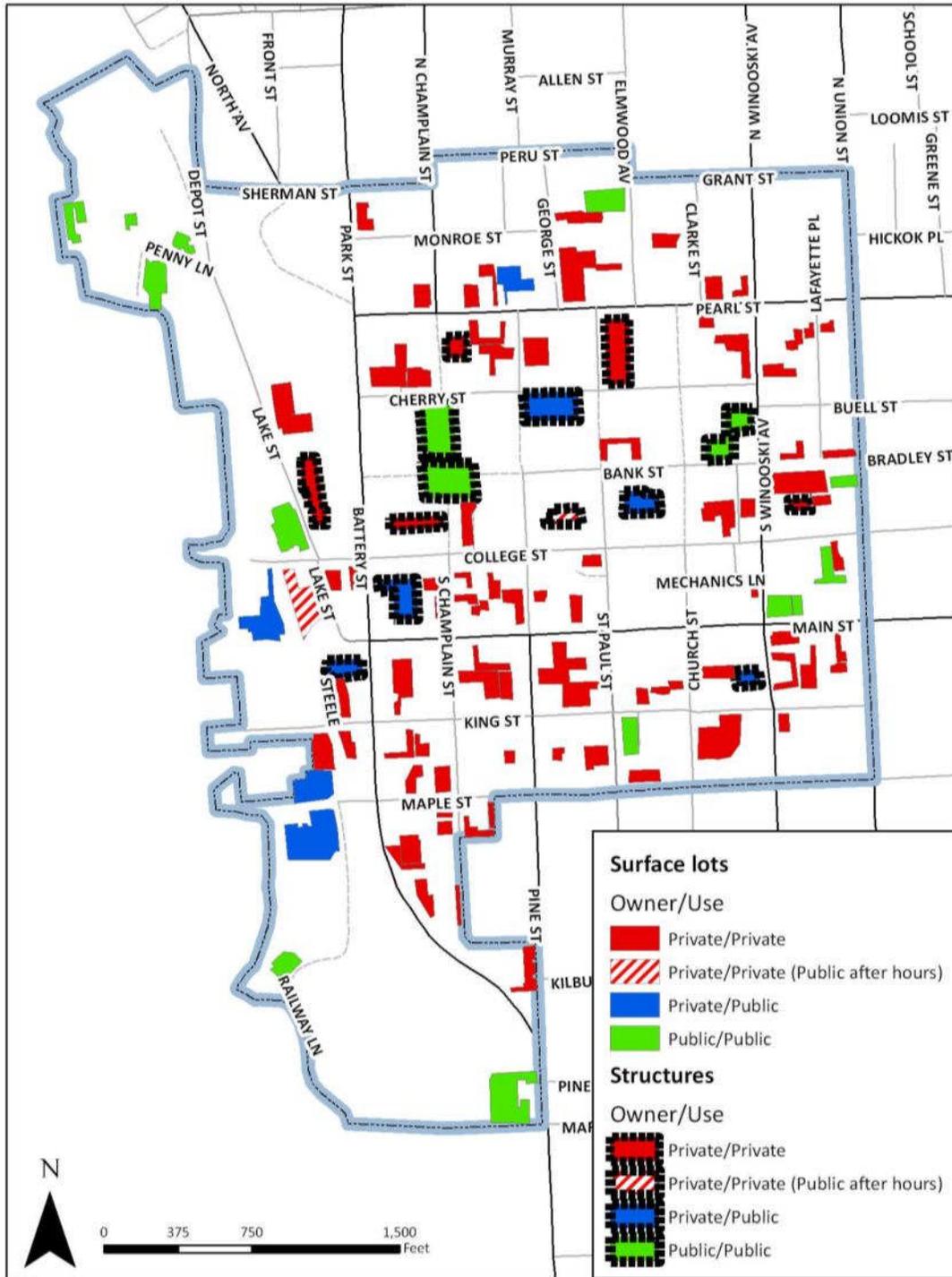
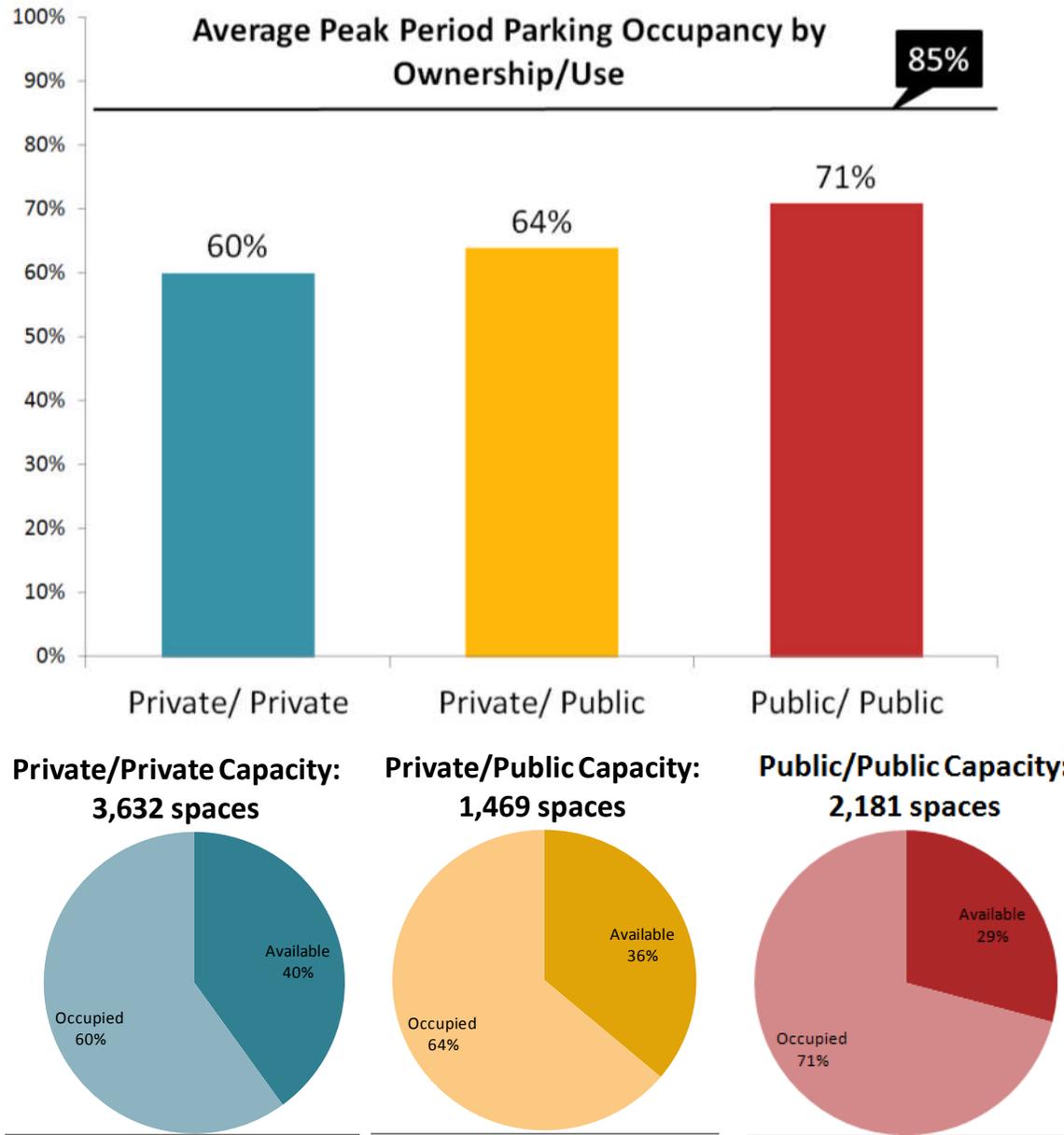


Figure 43: Peak Period Parking Occupancy by Ownership/Use



The Department of Public Works Traffic Division provided information regarding the amounts and sources of parking revenue - totaling approximately \$8.3M annually. This includes revenues from on-street parking meters, City-owned garages both downtown and at the Airport, and the Downtown Improvement District special assessment to provide 2-hrs of free parking downtown. While over 90% of these revenues are used to cover operations and maintenance, approximately \$780,000 of parking revenues are used to pay for a variety of non-parking programs such as traffic signals, flower planting, and school crossing guard programs.



Figure 44: Structured Parking Occupancy and Ownership/Use Type



The 2011 data are generally consistent with the patterns identified in the 2003 parking study, except that the College Street garage is now significantly more occupied than the Lakeview garage. This may be because People’s United Bank (formerly Chittenden Bank) no longer has their employees park off-site at the Lakeside Avenue lot and take the PARC shuttle into downtown.

4.3 Future Parking Conditions

An analysis of the future parking supply necessary to support 2040 land use within the study area has been conducted for the same scenarios as the future circulation analysis, Section 3.2:

- 1) the 2040 Base Case (business as usual)(19,780 total jobs and 4,225 total residences in the study area) ;
- 2) Transportation Improvements (3 new park&ride/intercept facilities and increased CCTA frequencies) (19,780 total jobs and 4,225 total residences in the study area); and,
- 3) Balanced Land Use (addressing the jobs/housing imbalance by increasing the amount of housing relative to jobs) (14,579 total jobs and 4,858 total residences in the study area).

The jobs and household estimates provided in Scenario 2, the balanced land use scenario, projects an increase of over 1,600 jobs and 2,300 housing units in the study area. Under this more balanced land use projection, an additional requirement of 1,654 parking spaces are projected as necessary (a 19% increase over existing supply), further supporting the positive impact on parking and circulation that a more



balanced jobs-housing ratio could provide. As with the Base Case, this projection assumes continuation of current parking requirements for residential dwellings of one space per unit. These findings are summarized in Table 12.

Table 12 have been converted into gross square footage based on housing and commercial square foot estimates developed for existing conditions. To maintain an 85% parking occupancy rate, the analysis shows that a ratio of 0.83 parking spaces per 1,000 square feet of commercial building area is necessary. Parking requirements for residential uses are tied to the current zoning requirements of one parking space per dwelling unit.

Scenario 2, the balanced land use scenario, projects an increase of over 1,600 jobs and 2,300 housing units in the study area. Under this more balanced land use projection, an additional requirement of 1,654 parking spaces are projected as necessary (a 19% increase over existing supply), further supporting the positive impact on parking and circulation that a more balanced jobs-housing ratio could provide. As with the Base Case, this projection assumes continuation of current parking requirements for residential dwellings of one space per unit. These findings are summarized in Table 12.

Table 12 shows the results of this analysis. As the study area is currently under a surplus parking condition (peak occupancy is 65%), the study area can accommodate the additional growth to increase utilization to the 85% occupancy rate. However, under the assumptions of high job growth projected for the Burlington Downtown-Waterfront Base Case, where employment in the study area increases from a little under 13,000 jobs in 2010 to nearly 20,000 by 2040, an increased requirement of over 3,000 parking spaces is projected. This amounts to a 34% increase in parking supply within the study area. This projection assumes the continuation of current parking requirements for residential dwellings of one space per residential unit.

Scenario 2, the balanced land use scenario, projects an increase of over 1,600 jobs and 2,300 housing units in the study area. Under this more balanced land use projection, an additional requirement of 1,654 parking spaces are projected as necessary (a 19% increase over existing supply), further supporting the positive impact on parking and circulation that a more balanced jobs-housing ratio could provide. As with the Base Case, this projection assumes continuation of current parking requirements for residential dwellings of one space per unit. These findings are summarized in Table 12.

Table 12: 2040 Jobs, Households, Commercial and Housing Square Footage, and Parking Supply within the Study Area

| | 2040 BDW Base | 2040 Balanced Land Use |
|-------------------------------------|---------------|------------------------|
| Jobs | 19,780 | 14,579 |
| Households | 4,225 | 4,858 |
| SF in Commercial (est.) | 9,268,222 | 6,831,214 |
| SF in Housing (est.) | 6,441,435 | 7,406,507 |
| BDW Parking Supply at 85% Occupancy | 11,880 | 10,500 |
| Net Change from Existing (8846) | 3,034 | 1,654 |

Incorporating parking management factors, as described in Section 5.0, would be consistent with the overall goals and objectives of concentrated downtown development. Assuming that parking reduction factors, implemented over the planning horizon to 2040, would reduce the parking requirement for residential units from 1 space per unit to 0.5 spaces per unit, parking supply within the study area would only need to increase by approximately 500 spaces above the current supply (a 6% increase). Note that further reductions in residential parking requirements to as low as 0.33 per unit may be possible. Hence, the foregoing analysis projects a more conservative future condition where parking requirements are reduced gradually as other supporting travel demand management measures are co-implemented. Table 13 shows



the results of this analysis compared with the results from Scenario 2, the balanced land use scenario, projects an increase of over 1,600 jobs and 2,300 housing units in the study area. Under this more balanced land use projection, an additional requirement of 1,654 parking spaces are projected as necessary (a 19% increase over existing supply), further supporting the positive impact on parking and circulation that a more balanced jobs-housing ratio could provide. As with the Base Case, this projection assumes continuation of current parking requirements for residential dwellings of one space per unit. These findings are summarized in Table 12.

Table 12.

Table 13: Jobs, Households, Commercial and Housing Square Footage, and Parking Supply within the Study Area, Showing the Impact of Parking Reduction Policies for Residential Development

| | 2040 BDW Base | 2040 Balanced Land Use | 2040 Balanced Land Use with Parking Reduction Policies |
|-------------------------------------|---------------|------------------------|--|
| Jobs | 19,780 | 14,579 | 14,579 |
| Households | 4,225 | 4,858 | 4,858 |
| SF in Commercial (est.) | 9,268,222 | 6,831,214 | 6,831,214 |
| SF in Housing (est.) | 6,441,435 | 7,406,507 | 7,406,507 |
| BDW Parking Supply at 85% Occupancy | 11,880 | 10,500 | 9,338 |
| Net Change from Existing (8846) | 3,034 | 1,654 | 492 |

5.0 PARKING ORDINANCE AND POLICY REVIEW

Local and regional planning documents include various objectives that support or are supported by more efficient parking management, including commitments to:

- Encourage more compact, infill development and discourage sprawl. “The single most important factor to improving transportation system performance is to move toward a land use pattern based on concentrated development similar to that identified in the CCRPC Regional Plan”¹.
- Encourage automobile travel reductions and shift to alternative modes (walking, cycling, ridesharing, public transit, telework). “In 2030, every Burlington resident has access to a diverse, seamless, multi-modal transportation system to travel easily to jobs, businesses, and recreational and cultural activities. Increased public transit and alternative transportation provides local and regional travel that is safe, accessible, efficient, and environmentally sound. Transportation within, to, and from the city relies less on individual vehicles and integrates the automobile with rail, bus, shuttle, boat, air, pedestrian, and bike transport”².
- Encourage more efficient utilization of parking facilities³.
- Increase housing affordability and reduce development costs. “No issue poses a greater challenge to the quality of life in our neighborhoods than that of providing good, affordable housing for all Burlington residents”¹.

¹ CCMPO (2010), *Metropolitan Transportation Plan (MTP)*. Chittenden County Metropolitan Planning Organization (www.ccmppo.org), p.59; at www.ccmppo.org/MTP.

² Burlington (2009), *Legacy Project Action Plan*, City of Burlington (www.ci.burlington.vt.us), p.17; at <http://burlingtonlegacyproject.org>.

³ CCMPO (2010), *Metropolitan Transportation Plan (MTP)*. Chittenden County Metropolitan Planning Organization (www.ccmppo.org), p.68-69; at www.ccmppo.org/MTP.



Parking policies significantly affect land use development and travel activity. It is therefore important that parking policies be aligned with other strategic planning goals.

Parking planning is undergoing a *paradigm shift*, that is, a change in how problems are perceived and solutions evaluated. The old paradigm assumes that transportation means driving, that parking lots should almost never fill, that parking costs should be borne indirectly by governments and businesses, and that every destination should satisfy its own parking needs. The new paradigm strives to provide *optimal* parking supply and price. It assumes that transportation can include multiple modes. It considers too much supply as harmful as too little, and prices that are too low as harmful as those that are too high. The new paradigm strives to use parking facilities efficiently. It considers full lots to be acceptable, provided that additional parking is available nearby and any spillover problems are addressed. It favors charging parking facility costs to users and encouraging use of alternative modes.

The old paradigm places a heavy burden of proof on change and innovation. The new paradigm recognizes that conditions often change, and parking policies should be adjusted in response. Table 14 compares old and new parking paradigms.

The old parking paradigm can result in a self-reinforcing cycle of increased automobile dependency, which involves increased automobile ownership, more automobile-oriented transport planning, reduced travel options, more dispersed land use development, and increased parking supply, as illustrated in Figure 45. More efficient parking management can help break this cycle. It both supports and is supported by policies that encourage use of alternative modes and more compact land use development.

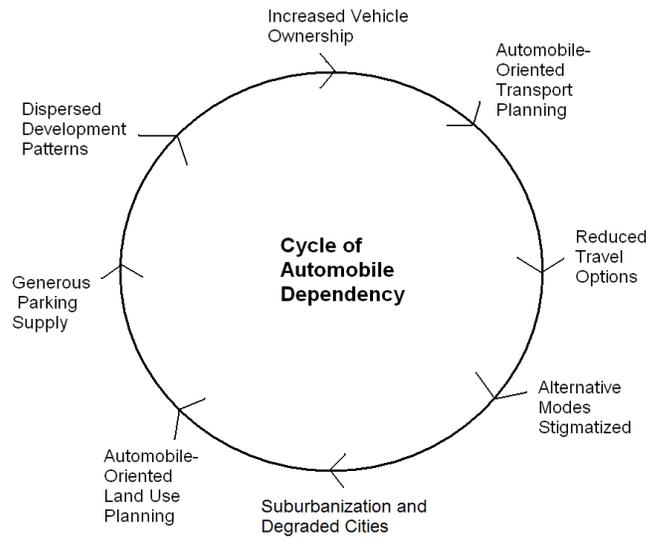
Table 14: Old and New Parking Paradigms Compared

| Old Parking Paradigm | New Parking Paradigm |
|---|---|
| Parking problem means inadequate parking supply. | There can be many types of parking problems, including inadequate or excessive supply, too low or high prices, inadequate user information, and inefficient management. |
| Transportation means driving. | Travelers may use various modes. Not everybody drives. |
| Abundant parking supply is always desirable. | Too much supply is as harmful as too little. |
| All parking demand should be satisfied on-site. Motorists should not be forced to walk to their cars. | Parking can often be provided off-site, allowing sharing of parking facilities among various destinations. |
| Parking should generally be provided free, funded indirectly, through rents and taxes. | As much as possible, users should pay directly for parking facilities. |
| Parking should be available on a first-come basis. | Parking should be regulated to encourage efficiency and favor high priority uses such as service vehicles, deliveries, customers, quick errands, and people with special needs. |
| Parking requirements should be applied rigidly, without exception or variation. | Parking requirements should reflect each particular situation, and should be applied flexibly. |
| Innovation faces a high burden of proof and should only be applied if widely accepted. | Innovations should be encouraged, since even unsuccessful experiments often provide useful information. |
| Parking management is a last resort, to be applied only if increasing supply is infeasible. | Parking management programs should be widely applied to prevent parking problems. |
| Land use dispersion (sprawl) is acceptable or even desirable. | Dispersed, automobile-dependent development can be harmful. |

¹ Burlington (2009), *Legacy Project Action Plan*, City of Burlington (www.ci.burlington.vt.us), p.22; at <http://burlingtonlegacyproject.org>.



Figure 45: Cycle of Automobile Dependency



5.1 Defining Parking Problems

It is important to carefully define parking problems. For example, if people complain about a parking problem, it is important to determine the exact problem type, location and time. Table 15 below lists various parking problems and compares the impacts of increasing parking supply with management solutions. Increasing supply helps reduce parking congestion and spillover problems but increases most other problems. Management solutions tend to reduce most problems, providing a greater range of benefits and so are supported by more comprehensive planning.

Table 15: Comparing Increased Supply and Management Solutions

| Problem | Increased Supply | Management Solutions |
|---|--|--|
| <i>Parking congestion.</i> Too many vehicles trying to use available parking facilities. | Positive. Increases number of available parking spaces. | Positive. Results in more efficient use of parking supply. |
| <i>Spillover.</i> Problems from motorists parking where they are not wanted. | Positive. Reduces incentive for motorists to use off-site spaces. | Mixed. Some management strategies increase spillover problems, others reduce them. |
| <i>Facility costs.</i> Increased development and operating costs for parking facilities. | Negative. Increases facility costs. | Positive. Reduces parking facility costs. |
| <i>Traffic congestion.</i> Too many vehicles for existing road capacity. | Negative. Generous, free parking increases vehicle use. | Positive. Many management strategies reduce vehicle use. |
| <i>Inequity.</i> Distribution of costs, including cost burdens on people who do not use parking facilities. | Negative. Forces non-drivers to pay for parking they do not use. | Positive. Reduces costs borne by non-drivers and improves accessibility options. |
| <i>Tax costs.</i> Tax burden required to subsidize parking facilities. | Negative. Often involves public subsidy of parking. | Positive. Reduces the need to subsidize parking facilities. |
| <i>Environmental impacts.</i> Loss of greenspace, stormwater management costs, air pollution, unattractive landscapes. | Negative. Increases the total amount of land paved for parking, and increases total vehicle ownership and use. | Positive. Reduces total parking requirements and vehicle use. |
| <i>Sprawl.</i> Encouraging dispersed, urban fringe development, and discouraging multi-modal, urban infill development. | Negative. Discourages infill and encourages more dispersed, urban fringe, automobile-oriented development. | Positive. Encourages smart growth development patterns. |



5.2 Determining Optimal Parking Supply

Various approaches and assumptions can be used to determine the number of parking spaces that are considered optimal in a particular situation, and therefore the methods that should be used to establish minimum parking requirements and evaluate parking variants.

- Motorists want abundant, convenient and preferably free parking; they generally assume that more is better.
- Businesses want an adequate supply of parking for customers and employees, at minimal cost.
- According to economic theory, optimal parking supply is the amount that motorists would willingly purchase if they have adequate options (different travel modes, parking facilities and payment options), and pay directly to finance the facilities.
- Local governments often assume that optimal parking supply is whatever is recommended by professional organizations, such as the Institute of Transportation Engineers, or whatever is adopted by neighboring jurisdictions.

Efficiency-based standards size parking facilities for optimal utilization. This means that most parking lots will often be filled, provided that management strategies can insure user convenience and address any problems. For example, a store's parking lot can be sized to fill during the weekly peak, provided that overflow parking is available nearby, motorists have information about available parking options, and regulations are adequately enforced to address any spillover problems. Efficiency-based standards take into account geographic, demographic and management factors that affect parking demand, and to reflect strategic planning objectives such as a desire for more compact development or reduced automobile traffic.

Because it is not possible to predict exact parking demand and management program effectiveness, efficiency-based standards rely on *contingency-based planning*, which means that planners identify solutions that can be deployed if needed in the future. For example, if a new building is predicted to need 60 to 100 parking spaces, the conventional approach is to supply either the middle value (80 spaces), or the maximum value (100 spaces). With contingency-based planning, the lower-bound value (60 spaces) is initially supplied, conditions are monitored, and various strategies are identified for implementation if needed. This may include banking land for additional parking supply and various parking management programs. This allows planners to use lower parking standards with the confidence that any resulting problems can be easily solved.

Eliminating parking requirements does not eliminate parking supply, it simply allows property owners to supply the amount they consider appropriate in their specific circumstances, rather than a generic amount required by the city. The main reason that cities impose generous parking requirements is to avoid unwanted spillover impacts (motorists causing parking congestion in nearby areas). Significantly reduced or eliminated minimum parking requirements may therefore require better parking management and enforcement to address spillover problems.

5.3 Parking Facility Costs

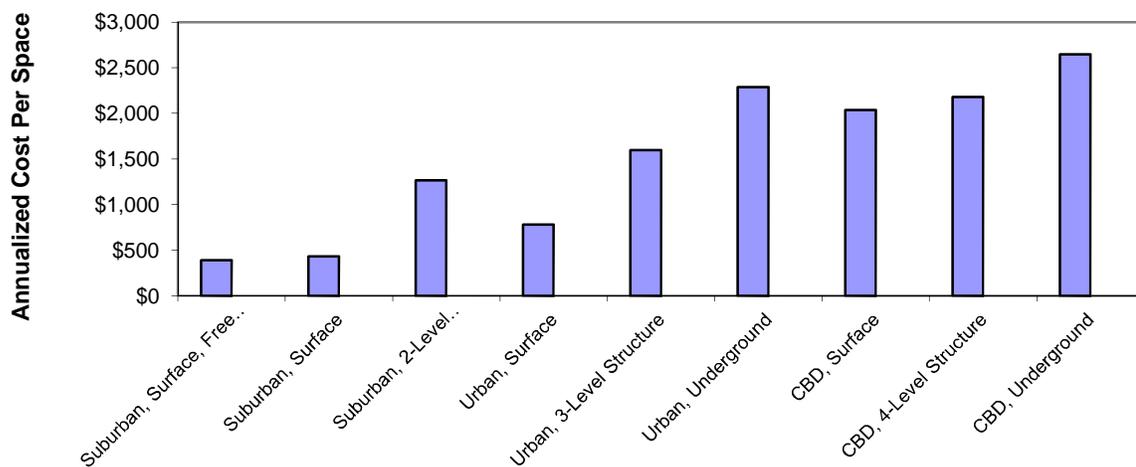
Parking management can provide substantial savings compared with expanding parking supply. Parking facility costs include land, construction and operations and maintenance (O&M), plus indirect costs, such as increased stormwater management costs. Table 16 and Figure 46 illustrate examples of these costs of various types of parking facilities. This varies from about \$400 per space if otherwise unused land is available, and construction and operating costs are minimal, to more than \$2,250 for structured parking with attendants.



Table 16: Typical Parking Facility Financial Costs¹

| Type of Facility | Land Per Space | Construction Per Space | O & M Annual, Per Space | Total Costs Annual, Per Space |
|---------------------------------|-------------------|---------------------------|----------------------------|----------------------------------|
| Suburban, Surface, Free Land | \$0 | \$2,000 | \$200 | \$389 |
| Suburban, Surface | \$455 | \$2,000 | \$200 | \$432 |
| Suburban, 2-Level Structure | \$227 | \$10,000 | \$300 | \$1,265 |
| Urban, Surface | \$2,083 | \$3,000 | \$300 | \$780 |
| Urban, 3-Level Structure | \$694 | \$12,000 | \$400 | \$1,598 |
| Urban, Underground ² | \$0 | \$20,000 | \$400 | \$2,288 |
| CBD, Surface | \$15,385 | \$3,000 | \$300 | \$2,035 |
| CBD, 4-Level Structure | \$3,846 | \$15,000 | \$400 | \$2,179 |
| CBD, Underground | \$0 | \$25,000 | \$500 | \$2,645 |

Figure 46: Typical Parking Facility Financial Costs³



Parking costs are often considered “sunk” (already paid and unrecoverable), but at various times most parking facilities have opportunity costs, for example, to avoid the need to expand parking facilities to accommodate increased demand, or to allow the land to be used for other purposes. As a result, more efficient parking management can often provide substantial savings and benefits, provided that municipal regulations allow parking supply to be reduced.

5.4 Current Ordinance

Like most North American cities, the City of Burlington has various ordinances concerning parking supply and use. The Comprehensive Development Ordinance, Version 9.1.10, Table 8.1.8-1, specifies the number of parking spaces required for various land uses in three districts: Neighborhood, Shared Use and Downtown. Figure 47 illustrates a small portion of the City’s minimum parking ordinance. The current parking requirements apply lower ratios to some land uses if located in the Shared and Downtown districts, reflecting geographic factors such as increased density and mix, and transport options. However, this approach is crude and incomplete:

¹ Todd Litman (2009), “Parking Costs,” *Transportation Cost and Benefit Analysis*, Victoria Transport Policy Institute (www.vtpi.org/tca).

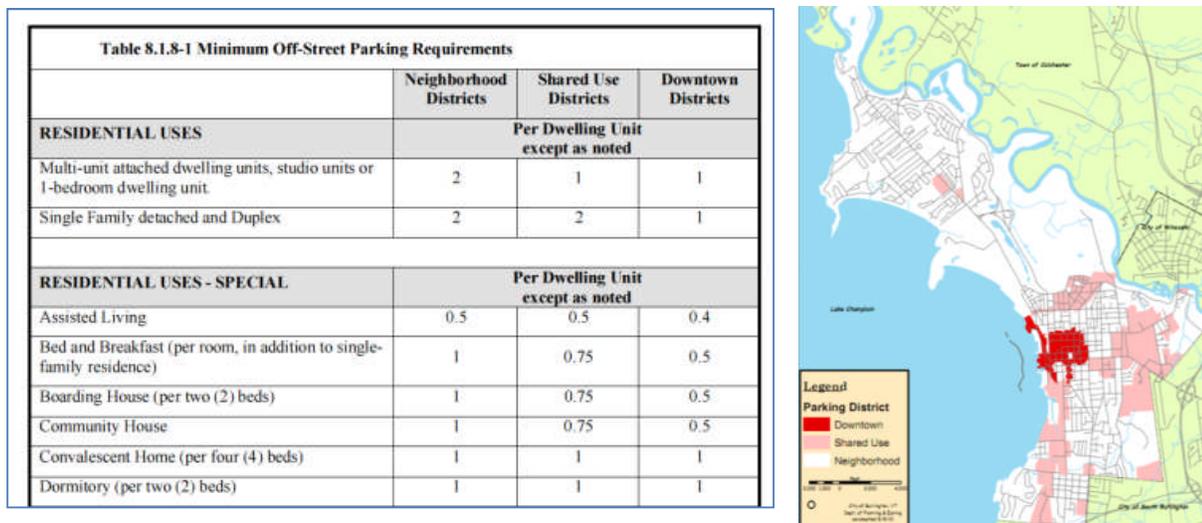
² Experience with local Burlington projects has shown underground parking costs of approximately \$35,000 per space.

³ Todd Litman (2009), “Parking Costs,” *Transportation Cost and Benefit Analysis*, Victoria Transport Policy Institute (www.vtpi.org/tca).



- In some cases (Convalescent Homes, Daycare, General Office) there are no differences between districts.
- In some cases (Dry Cleaning Service, Food Processing, Manufacturing) there are only a small differences between districts.
- In some cases (Film Studio, Lumber Yard, Office-Medical, Dental) there are large differences between districts (Neighborhood requirements are often three times higher than Downtown).
- In many cases the Downtown District has no minimum parking requirement. These are typically retail and businesses (Bar/Tavern, Beauty/Barber Shop, Bicycle Sales/Repair, and Billiard Parlor), recognizing that many downtown customers and employees arrive without a car, or use nearby on-street or public off-street parking. However, it is unclear why other types of land uses with similar customer/client and employee profiles (Convenience Store, Museum, Salon/Spa) are required to provide off-street parking.

Figure 47: Existing Parking Requirements¹



In general, these are within the normal range of North American parking requirements but are often higher than needed and contradict other planning objectives. For example:

- Neighborhood bars and taverns have relatively high parking requirements (4 spaces per 1,000 square feet). These can often be significantly reduced since many patrons walk to them, and this parking can often be shared with other nearby uses that have different peak periods.
- Boarding house occupants tend to be low income so it is unlikely that they really need one parking space per 2-4 beds. This discourages affordable housing development, and redevelopment of existing boarding houses.
- Most communities want to increase affordable housing supply, particularly in central areas, and many apartment residents own no vehicles. The requirement for all multi-family housing units, including single bedroom and studio apartments to have 2 parking spaces if located in Neighborhood districts or one parking space if in Shared or Downtown districts seems excessive. It

¹ Burlington (2008, Amended 2010), "Article 8: Parking," *Comprehensive Development Ordinance, Version 9.1.10*, City of Burlington (www.ci.burlington.vt.us); at www.ci.burlington.vt.us/planning/zoning/cdo/docs/article_08_parking.pdf.



discourages affordable housing development, and redevelopment of existing multi-family housing, and is unfair to residents who own no cars.

- The requirement for 2 parking spaces per 1,000 square feet of office space applies equally in all districts. This is likely to be excessive in Downtown locations. It discourages businesses from implementing parking and transport management strategies since this may result in costly parking spaces being unoccupied, and can significantly constrain downtown commercial development.
- The requirement for 0.75 parking spaces per hotel or motel room in the Shared and Downtown districts assumes that most (75%) of visitors arrive by car, and that all parking demands will be met on-site. This appears high for a multi-modal district, and contradicts efforts to encourage concentrated downtown accommodations.
- The generous parking requirements for grocery and general merchandise stores, and health clubs, discourage development of neighborhood commercial services.
- The ordinance states that, “Any waiver granted shall not exceed fifty percent (50%) of the required number of parking spaces...” This restriction seems excessive since effective parking management often reduces demand by more than half.

The methods used to establish these minimum parking requirements often incorporate features that tend to bias the values upward. They are based on the 85th demand curve, 85% occupancy rates, and the tenth annual design day, meaning that 85 out of 100 individual sites will have 15% unoccupied parking spaces even during the tenth busiest day of the year. They are based on parking demand surveys published in the *ITE Parking Generation Report* that were mostly performed in suburban areas where parking is unpriced and there are few alternatives to driving¹. The resulting values are often much higher than actually needed in most locations, resulting in economically excessive supply². Such regulations reflect the assumptions that most residents and visitors will travel by automobile, that most parking should be supplied on-site, and that parking facility costs are modest and should be subsidized. According to this perspective, parking management is a special solution that is only applied in a few situations where meeting conventional parking requirements is infeasible.

Table 17 illustrates various adjustment factors that can be applied to conventional minimum parking regulations so they more accurately match parking supply with actual demand in a particular situation. These reduced and more flexible parking requirements both support and are supported by more efficient parking management. Such adjustment factors can be implemented in various ways: they can be incorporated into parking ordinances, implemented administratively by planning agencies, or used as guidelines when city councils approve parking variances. The parking requirements in Burlington’s Downtown and Shared Use parking districts reflect some but not all of these adjustment factors.

To evaluate the acceptability of reduced and more flexible parking requirements and increased emphasis on parking management decisions-makers should consider the following questions:

- What are expectable performance standards? For example, how far should motorists be expected to walk between vehicles and destinations, and how much should motorists be charged for?
- How severe is the problem if motorists cannot always find an unoccupied on-site parking space?

¹ ITE (2005), *Parking Generation*, Institute of Transportation Engineers (www.ite.org).

² Matthew R. Cuddy (2007), *A Practical Method For Developing Context-Sensitive Residential Parking Standards*, Dissertation, Rutgers University (www.rutgers.edu); at http://transportation.northwestern.edu/news/2007/Cuddy_dissertation_final_cv.pdf; Wesley E. Marshall and Norman W. Garrick (2006), *Parking at Mixed-Use Centers in Small Cities*, *Transportation Research Record 1977*, Transportation Research Board (www.trb.org); www.darien.org/communitymatters/blog/archives/ParkingstudyfromUConn.doc; also see, 'Place First' Parking Plans (www.planetizen.com/node/34152).



- Who is responsible for solving parking problems, and who should bear parking facility costs?

Table 17: Parking Requirement Adjustment Factors

| Factor | Description | Typical Adjustments |
|-----------------------------|--|---|
| Geographic Location | Vehicle ownership and use rates in an area. | Adjust parking requirements to reflect variations identified in census and travel survey data. |
| Residential Density | Number of residents or housing units per acre/hectare. | Reduce requirements 1% for each resident per acre (e.g. 15% where at 15 residents per acre and 30% at 30 res. per acre). |
| Employment Density | Number of employees per acre. | Reduce requirements 10-15% in areas with 50 or more employees per gross acre. |
| Land Use Mix | Range of land uses located within convenient walking distance. | Reduce requirements 5-10% in mixed-use developments. Additional reductions with shared parking. |
| Transit Accessibility | Nearby transit service frequency and quality. | Reduce requirements 10% within ¼ mile of frequent bus service, and 20% within ¼ mile of a rail transit station. |
| Carsharing | Whether carsharing vehicles are located nearby. | Reduce residential requirements 5-10% if carsharing vehicles are located nearby, or 4-8 spaces for each carshare vehicle. |
| Walkability | Walking environment quality. | Reduce requirements 5-15% in walkable communities, and more if walkability allow more shared and off-site parking. |
| Demo-graphics | Age and physical ability of residents or commuters. | Reduce requirements 20-40% for housing for young (under 30) elderly (over 65) or disabled people. |
| Income | Average income of residents or commuters. | Reduce requirements 10-20% for the 20% lowest income households, and 20-30% for the lowest 10%. |
| Housing Tenure | Whether housing are owned or rented. | Reduce requirements 20-40% for rental versus owner occupied housing. |
| Pricing | Parking that is priced, unbundled or cashed out. | Reduce requirements 10-30% for cost-recovery pricing (i.e. parking priced to pay the full cost of parking facilities). |
| Unbundling Parking | Parking sold or rented separately from building space. | Unbundling parking typically reduces vehicle ownership and parking demand 10-20%. |
| Parking & Mobility Mangt. | Parking and mobility management programs implemented at a site. | Reduce requirements 10-40% at worksites with effective parking and mobility management programs. |
| Design Hour | Number of allowable annual hours a parking facility may fill. | Reduce requirements 10-20% if a 10 th annual design hour is replaced by a 30 th annual peak hour. Requires overflow plan. |
| Contingency -Based Planning | Supply fewer spaces and implement additional strategies if needed. | Reduce requirements 10-30%, and more if a comprehensive parking management program is implemented. |



Table 18 describes various parking management strategies and the typical reductions in the number of parking spaces needed to maintain a particular level of performance in a specific situation. Not all are appropriate in every situation and their impacts can vary significantly depending on specific conditions. An integrated parking management strategy can often reduce parking requirements by 20-40%, and even more if implemented with complementary transport and land use policies, such as public transit improvements and more compact development.

Table 18: Parking Management Strategies

| Strategy | Description | Typical Reductions |
|--|---|--------------------|
| Shared parking | Parking spaces serve multiple users or destinations, including sharing rather than assigning reserved spaces to users, and sharing facilities among multiple destinations | 20% |
| Parking regulations | Regulations that favor higher-value uses such as service vehicles, deliveries, customers, quick errands, and people with special needs. | 20% |
| More accurate and flexible standards | Parking standards are adjusted to reflect demand in a particular situation taking into account geographic, demographic and management factors | 20% |
| Parking maximums | Establish maximum parking standards | 20% |
| Remote parking | Provide off-site or urban fringe parking facilities and encourage their use | 20% |
| Smart growth | Encourage more compact, mixed, multi-modal development, which encourages sharing of parking facilities and use of alternative modes | 20% |
| Walking & cycling improvements | Improve walking and cycling conditions to expand the range of destinations serviced by a parking facility and reduce vehicle trips | 10% |
| Increase capacity of existing facilities | Increase parking supply by using otherwise wasted space, smaller stalls, car stackers and valet parking | 10% |
| Mobility management | Encourage more efficient travel patterns, including changes in mode, timing, destination and vehicle trip frequency | 20% |
| Parking pricing | Charge motorists directly for using parking facilities, with efficient prices that are higher during peak times and locations | 20% |
| Improve pricing methods | Use better charging techniques to make pricing more convenient and cost effective | NA |
| Financial incentives | Provide financial incentives to shift mode, such as parking cash-out and transit benefits, often as an alternative to parking subsidies | 20% |
| Unbundle parking | Rent or sell parking facilities separately from building space | 20% |
| Bicycle facilities | Provide bicycle storage and changing facilities | 10% |
| Improve user information | Provide convenient and accurate information on parking availability and price, using maps, signs, brochures and electronic communication | 10% |
| Improve enforcement | Insure that parking regulation enforcement is efficient and considerate | NA |
| Transportation management assoc. | Establish member-controlled organizations that provide transport and parking management services in a particular area | NA |
| Overflow plans | Establish plans to deal with periods of peak parking demand | NA |
| Address spillover problems | Use management, enforcement and pricing to address spillover problems, such as undesirable use of nearby parking facilities | NA |
| Parking facility design & operations | Improved parking facility design and operations to help solve problems and achieve parking management objectives | NA |



Many buildings in Downtown Burlington have features that reduce on-site parking demands:

- They have good walking, cycling and public transit, and so tend to attract customers/clients and employees who rely on alternative modes.
- They serve tourists and people with disabilities, who often use alternative modes.
- They serve downtown employees who, if they drive, often park at their worksite and walk to shopping.
- Many businesses have lower-wage employees.
- They do not involve carrying heavy loads (such as would be required at a lumber yard).
- They offer many off-site parking options, including on-street and public off-street parking.
- Providing off-street parking is costly, so businesses have a strong incentive to implement parking management strategies as an alternative to expanding supply.

For these reasons it makes sense that Downtown District parking requirements should generally be about a third of those in Neighborhood Districts. However there is some uncertainty, so the amount that parking requirements should be reduced depends, in part, on the perceived risks and willingness to implement responsive policies if needed. If spillover parking is totally unacceptable and the city is unwilling to implement new on-street parking regulations and enforcement to address such problems, then high minimum parking requirements should continue. If some spillover parking, or some increase in parking regulation and enforcement activities are accepted, then much lower or eliminated parking requirements are appropriate. Note that this does not mean that off-street parking will not be provided, it simply allows the developer to decide how much to provide based on market demands.

Based on these factors, the following land use categories seem to have significantly excessive Downtown District parking requirements:

- | | | |
|-----------------------------|-----------------------------------|--------------------------------------|
| ▪ Multi-unit dwelling units | ▪ Convention Center | ▪ Office – General |
| ▪ Assisted Living | ▪ Courthouse | ▪ Taxi Operations Center |
| ▪ Bed and Breakfast | ▪ Daycare – Small | ▪ Printing Plant |
| ▪ Boarding House | ▪ Distribution Center | ▪ Radio & TV Studio |
| ▪ Community House | ▪ Dry Cleaning Plant and Services | ▪ Recording Studio |
| ▪ Convalescent Home | ▪ Food Processing | ▪ Research Lab |
| ▪ Group Home | ▪ Hospitals | ▪ Salon/Spa |
| ▪ Historic Inn | ▪ Hotel/Motel | ▪ Primary and Post-Secondary Schools |
| ▪ Sorority & Fraternity | ▪ Machine Shop/Woodworking Shop | ▪ Warehouse |
| ▪ Adult Day Care | ▪ Manufacturing | ▪ Warehouse – Retail |
| ▪ Bakery – Retail | ▪ Marina (per berth) | ▪ Wholesale Sales |
| ▪ Bank, Credit Union | ▪ Museum | ▪ Place of Worship |

Even these reductions are only a start. Additional reductions are often justified if a location has additional features that reduce parking demands, such as a lower-priced apartment building, a condominium with unbundled parking and on-site carsharing vehicles, or a business with a strong commute trip reduction program. It is good public policy to reward such policies with additional reductions in parking requirements, since they provide additional benefits.



For example, this analysis indicates that in the Downtown District, parking requirements for General Office uses should be a third of those in Neighborhood Districts, or 0.66 spaces per 1,000 square feet (sf) of interior space. However, if an employer implemented a commute trip reduction program with subsidized transit passes, this could be reduced another 20%, to 0.53 spaces per 1,000 sf. Table 19 illustrates these adjustments applied to three land use categories, based on reduction factors in Table 17 and Table 18. This type of analysis could be applied to the other land uses identified as having excessive parking requirements above.

Table 19: Parking Requirement Adjustment Factors

| Land Use Category | Existing Requirement | Recommended for Downtown | Additional Potential Adjustment Factors |
|--------------------------|----------------------|---|--|
| Multi-family Residential | 1 per housing unit | 0.33 (due to higher density and mix, improved travel options, and unbundled parking). | Lower income (reduce requirements 10-20% for the 20% lowest income households). Carsharing (reduce requirements 5-10% if carshare vehicles are nearby) |
| General Office | 2 per 1,000 sq ft. | 0.66 (due to higher density and mix, and improved travel options) | Commute trip reduction programs (reduce requirements 5-10% if based on persuasion, or 10-30% if the include significant financial incentives). |
| Dry Cleaning Service | 2 per 1,000 sq ft. | 0.66 (due to higher density and mix, and improved travel options) | Commute trip reduction programs (reduce requirements 5-10% if based on persuasion, or 10-30% if the include significant financial incentives). Shared off-site (reduce requirements another 20% if the business has arranges for employees to use an offsite parking lot, for example, at a nearby church). |

5.5 Parking Management Strategies

The following management strategies should be pursued in Burlington:

1. *Reduced and more flexible parking requirement.* Significantly reduce minimum parking requirements, particularly in central areas (downtown and nearby neighborhoods, and other major commercial centers). Incorporate standard adjustment factors by which minimum parking requirements are reduced for specific demographic, geographic and management factors, as in Table 17 of this report. The existing conditions assessment of this report suggests that parking occupancies are generally lower than the recommended 85% level, so the parking supply is not being used as efficiently as it could be. Therefore existing facilities should be managed more efficiently rather than building additional parking that will not be optimally used.
2. *Improve user information.* Providing convenient information to travelers on their parking supply and pricing options (such as real time information on the location and price of available parking spaces), and travel options (such as how to use public transit) allows travelers to choose alternative parking locations and transport options. The existing conditions assessment and stakeholder input indicate that finding parking is difficult, which speaks to the need for better user information to improve parking efficiency.



3. *Public-private partnership (PPP)*. A PPP could provide parking brokerage services (facilitating sharing of parking facilities among downtown businesses) and provide other parking and transportation management services. Currently, the lack of a single entity to organize and facilitate transportation and parking demand management programs and strategies prevents Burlington from realizing a more efficient and seamless transportation system. A PPP would organize services such as Guaranteed Ride Home Programs, bicycling and walking incentives, transit pass subsidies, parking brokerage and shared parking facilitation, and parking system data collection and management. The PPP could be funded by a parking enterprise fund, as described below.
4. *Shared parking*. As much as possible, parking facilities should serve multiple destinations, particularly downtown. This means encouraging use of on-street (curb) parking and shared off-street parking facilities in place of individual, dedicated off-street parking facilities at each destination. Shared parking would be facilitated by a PPP and would improve the utilization and efficiency of existing facilities that are less than 85% occupied during peak periods, reducing the need to build new parking.
5. *Parking enterprise fund*. This fund would generate revenue for parking demand management and operations management of existing facilities. The fund would be paid into as an alternative to building parking supply on private parcels. In contrast to in-lieu fees, this enterprise fund would be assured to be reinvested into the system. The enterprise fund would be used to pay for improvements such as parking wayfinding, meter upgrades, data collection, and parking demand management programs and services.

It would also be worthwhile to pursue the following parking management strategies:

- *Efficient parking regulations*. Implement regulations that control parking duration and use to favor higher value users, such as delivery vehicles, people with disabilities, and customers.
- *Efficient parking pricing with improved pricing methods*. Both on-street and off-street parking facilities can be priced to favor higher priority trips, encourage efficient use of parking facilities and encourage use of alternative modes (particularly by employees).
- *Financial incentives*. Efficient parking pricing, parking unbundling (renting parking spaces separately from building space), parking cash out (allowing travelers who are offered a subsidized parking space the option of choosing the cash equivalent if they use an alternative mode), and transit subsidies can encourage more efficient use of parking facilities.
- *Commute trip reduction programs*. Encourage or require employers (particularly larger city center employers) to implement commute trip reduction programs.
- *Walking and cycling improvements*. Improving area walkability expands the range of parking facilities that serve a destination, substitutes for some automobile trips directly, and supports public transit use.
- *Bicycle facilities*. Appropriate bicycle parking and clothes changing facilities can encourage shifts from automobile to bicycle travel.
- *Off-site parking with overflow parking plans*. This means, for example, that a business indicates where customers and employees should park when the on-site lot is full, and have a plan to address peak periods, such as busy shopping days and special events.
- *Improve enforcement*. It may be appropriate to improve parking regulation enforcement practices, including enforcement that is more responsive and courteous to motorists.
- *Parking facility design and operations*. Improve parking facility design and operations including more attractive lots and structures, improved safety and security, better maintenance, etc.



5.6 Ordinance Review Conclusions

The city of Burlington, Vermont has strategic planning objectives that include more compact development, reduced motor vehicle travel and shifts to alternative modes, and more affordable development. Current parking policies contradict many of these objectives. Various policy reforms which result in more efficient use of parking facilities and reduce parking supply requirements can better align parking decisions with strategic planning objectives.

Burlington currently imposes conventional minimum parking regulations and provides modest incentives and support to businesses and residents to more efficiently manage parking. The minimum parking regulations are often significantly higher than needed, particularly in areas with compact and mixed development, and multi-modal transport systems (good walking, cycling and public transit). These generous and inflexible standards tend to contradict many planning objectives, including efforts to reduce drunk driving, encourage urban infill, reduce vehicle traffic, and increase development affordability. The City reduces parking requirements in the Downtown and Shared Use districts, but even there parking requirements are often excessive and contradictory.

These regulations reflect the old parking planning paradigm, which assumes that parking should generally be abundant and free, and parking management need only be implemented in special conditions where increasing parking supply is infeasible. A new parking planning paradigm favors reduced and more flexible parking requirements with more emphasis on parking management strategies.

There are more than a dozen parking management strategies that may be appropriate in downtown Burlington. Some are already being implemented (such as transit access, walkability, and off-site parking), but could be applied more. Although individually their benefits may appear modest, typically reducing parking requirements at a particular location by just 5-15%, their impacts are cumulative and synergistic (total impacts are often greater than the sum of individual impacts), so an integrated parking management program can often reduce the number of parking spaces needed to provide a given level of service by 20% to 40%, and often higher if implemented with other transport and land use policy reforms. This can provide substantial savings and benefits, making parking management the most cost-effective solution to many problems.

6.0 PARKING & TRANSPORTATION ISSUES AND OPPORTUNITIES

To inform this section, we met with developers to gain an understanding of their experiences with development in Burlington and the barriers that they encounter. Notes from these meetings are included in Appendix E. Based on these meetings, the synthesis of prior plans & studies, the existing conditions assessment, and the review of the current parking ordinance, the following issues and ideas have been identified.

6.1 Parking

1. *Issue:* There is a common perception that there is a shortage of parking within the study area, and most agree that parking is very difficult to find due to a lack of user information. The parking inventory and utilization analysis, however, shows that parking is not being used optimally; that is, even during the peak period, most parking facilities (with the exception of on-street and the Marketplace garage) are less than 85% occupied. Therefore, while there may be some limited opportunities to create additional parking over the long-term, **the City's priority should be to manage existing parking resources more efficiently.**
2. *Issue:* Since parking can be very difficult to find, visitors and customers get frustrated with Burlington before they even get out of their vehicle. The **parking experience needs to be improved,** as this is the first impression of Burlington that visitors and customers will have.



3. *Issue:* Currently, cost and the availability of space for **parking determines redevelopment potential**. Therefore, one of the reasons that infill development is not taking place at the rate at which the City would like is because the requirements to provide parking make many projects infeasible from the developers' point of view. How can parking be managed and regulated so that it is not a barrier to infill development? What regulatory and management strategies can be implemented to provide alternatives to increasing parking capacity?
4. *Opportunity:* Being **pro-active in parking management**, for example, deploying new meter technologies, working with private property owners and developers to share parking, collecting data and surveying users, developing and administering demand management programs, etc., will help to improve efficiency. Public Works is in the process of improving **parking payment systems/meters and wayfinding**. This will enable management strategies that involve pricing, such as variable/peak period pricing, and improve user information. Wayfinding will reduce congestion resulting from drivers circulating as they hunt for a parking space. In addition, there are many great ideas and strategies to manage parking, but these initiatives need a home in order to be implemented. A **public/private partnership** to organize these efforts and to manage daily operations of the parking supply is needed.
5. *Issue:* **Lack of ongoing parking data collection**. Specifically, utilization (including turnover), user groups, and any spillover parking issues should be monitored so that operational issues can be identified and addressed. For example, parking leases could be moved to underutilized facilities if occupancy data were more readily available. Particularly because parking demand fluctuates depending on time of day, week, and year, ongoing data collection (such as a parking census) is needed to indicate parking trends and management gaps. As the saying goes, "you can't manage what you don't measure."
6. *Opportunity:* **If additional parking were needed in the future, where could it be built? How could it be paid for?** Does the current distribution of parking support Downtown and Waterfront destinations; is parking located where it is needed now and in the future? New parking would likely take 5-10 years to develop. Therefore, optimizing efficiency and use of the existing parking supply as a resource is necessary to minimize the need for new parking.

6.2 Circulation and Connectivity

1. *Opportunity:* There is an opportunity to develop a **seamless transportation system**, particularly through improvements to transit and to bicycle/pedestrian connectivity. The quality of existing transportation alternatives is not adequate to attract choice users and reduce parking and transportation demand.
2. *Opportunity:* Developing Park&Ride facilities to **intercept traffic entering the core**. Creating off-site parking connected to downtown via high-frequency shuttle will reduce parking demand and congestion in the core.
3. *Opportunity:* Improvements to **bicycle and pedestrian connectivity** (particularly Downtown to Waterfront, and north-south and east-west bicycle connections).
4. *Opportunity:* Improving **walkability**: even though physical infrastructure may be in place, the experience is not pleasant enough to attract pedestrians (e.g. College Street vs. Cherry Street).
5. *Opportunity:* Implementing **Complete Streets as described in the Burlington Transportation Plan**. The actual extent to which all of the elements contained in the adopted design guidelines can be applied to individual corridors will need to be evaluated on a case-by-case basis to best determine how to accommodate all modes while maintaining efficient circulation.
6. *Opportunity:* To improve parking efficiency, enhanced **traveler information** such as signs, maps, websites, and GPS, should be integrated to indicate parking availability relative to popular



destinations. Improvements to **wayfinding**, including real-time parking information, are currently underway by the City.

6.3 Land Use

1. *Opportunity: **Downtown's function as a 'neighborhood'*** needs to be maintained; it cannot serve visitors only, it needs to include services for residents and employees.
2. *Issue: **Jobs/housing balance:*** land use in the study area is heavily imbalanced toward jobs. Significant advantages are generated when jobs and housing are in better balance. Incentives to construct downtown housing, including reduction in parking requirements and enabling the unbundling of parking from housing, would help reduce barriers to infill housing development. Community input has specifically suggested a shortage of mid-level/"workforce" housing.

7.0 RECOMMENDATIONS

This section presents regulatory, organizational, and infrastructure recommendations to overcome parking and transportation barriers to infill development. This study has indicated that parking is underutilized because available spaces are hard to find and many spaces are restricted to private property owners and their clients. The study has also shown that addressing the jobs/housing imbalance in Burlington is estimated to more positively impact congestion and parking demand than transportation improvements alone. The recommendations focus on ways to improve parking efficiency to effectively utilize existing parking capacity, reduce parking demand, and stave off the need to build additional parking until existing resources are shown to be utilized to their fullest capacity.

7.1 Regulatory Recommendations

- **The primary recommendation of this study is to focus on residential development in the study area.** Not only does addressing the housing-jobs imbalance¹ in Burlington help to reduce congestion and parking demand by allowing more employees to walk, bike, or take transit to work, but there are also several tools to manage the parking demand associated with residential development. Section 4.4.1 (d) 1.B. of the Comprehensive Development Ordinance limits residential use in the Downtown and Downtown Waterfront Districts to 50% of the gross floor area of a site; this limit should be eliminated and the residential/non-residential mix of uses determined by the market.

Residential parking incentives and waivers appear to be the most workable from the standpoint of developers. Reducing parking needs for residential construction will lower construction costs and incentivize this type of investment. Some overnight residential parking can be satisfied in city or private parking garages. Unbundling parking from housing is attractive to developers and prospective residents who may not need (or want to pay for) a parking space. Some residents may be open to parking their car remotely if they only need it on weekends or for special trips. Vehicle limitation covenants, either in lease agreements or through homeowner associations, can also reduce the parking associated with residential uses.

- **Facilitate and encourage shared parking.** Because much of the existing parking supply in Burlington is restricted to private property owners and their clients, making existing parking accessible to more people is critical to increasing efficiency. The strategy is to use existing parking more intensively (for more hours of the day) rather than building new parking. As much as possible, parking facilities should serve multiple destinations, particularly in downtown and other mixed-use activity centers. This means encouraging use of on-street (curb) parking and shared off-street parking facilities in place of individual,

¹ As noted in the Burlington Municipal Development Plan, the CCMPO Metropolitan Transportation Plan, the CEDO Economic Development Plan, and others.



dedicated off-street parking facilities at each destination. The City of Charlotte, NC, is pursuing a public-private system of shared parking facilities, recognizing that “a well-organized system of parking, regardless of ownership, can result in better utilization of existing facilities and reduce the perceived need for additional parking....An important benefit is avoidance of an oversupply of parking that could compete with a growing transit system.”¹ While shared parking would likely be facilitated by a public-private partnership (described below), municipal policy can encourage shared parking in the following ways:

- Efficiently manage on-street parking with regulations and pricing to insure that it serves the greatest number of destinations. (That is, encouraging people to “park once” and walk to several points of interest rather than drive to them.)
- Establish standard procedures by which property owners are allowed to reduce their parking supply by sharing facilities. This should require minimum effort so it is feasible for smaller properties (e.g., a business that only needs less than ten parking spaces). For example, parking used 9AM to 5PM for an office can be used after hours for nearby restaurants.
- Work with business associations or through a public-private partnership (described below) to establish parking facility matching and brokerage services, which help individual businesses identify opportunities to share parking facilities. The service would also help to address barriers to shared parking, such as:
 - Unauthorized use of spaces: consider restricting access/use by charging fees, gating the access, using electronic access cards, etc..
 - How to share maintenance costs: consider pro-rating costs depending on parking use.
 - Marketability of a development with “less parking:” if sharing arrangements have been established, there should be access to as much parking as there would be if the site had its own dedicated facility.²
- **Parking requirements should be more flexible for developers if they incorporate demand offsetting elements** such as: being located near carshare pods; including vehicle limitation covenants or unbundled parking for residential developments; arranging shared parking (a methodology for determining the amount of parking appropriate for a shared facility is shown in Figure 48). Table 17 above presents adjustment factors that can be applied to parking requirements.

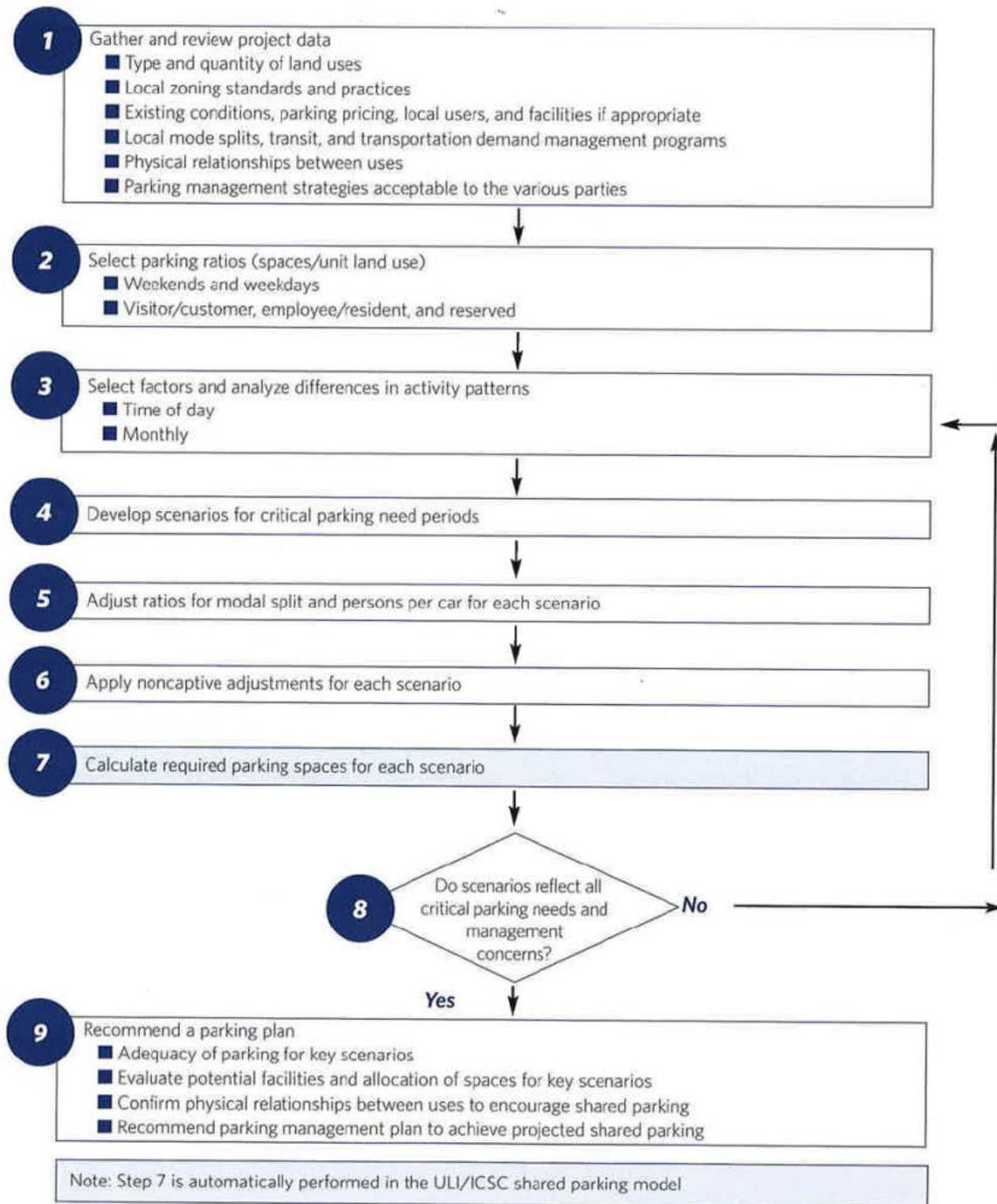
Minimum parking requirements are an appropriate regulatory measure in downtowns with limited space and where market forces will prevent an oversupply of parking- provided that the minimums are not too high. Minimum parking requirements help to address chronic spillover parking. However, as noted, minimum parking rates tend to be overly conservative and should be flexible to address overflow when it happens rather than accommodating it the majority of the time. In addition, parking demand rates in urban neighborhoods that are walkable, bikeable, and transit-accessible tend to be lower than in suburban and rural areas. Maximum parking restrictions are more appropriate in suburban and rural areas where land is less expensive. Maximum restrictions may make parking in urban areas scarce, with the potential for changing travel behavior and shifting mode splits away from single-occupancy vehicles since parking is expensive and difficult to find.

¹ Kimbler, J. “Real-Time Parking Wayfinding System” in the *Institute of Transportation Engineers (ITE) Journal*, December 2010.

² See page 15 of the US Environmental Protection Agency’s “Parking Alternatives: Making Way for Urban Infill and Brownfield Redevelopment,” 1999, which specifically addresses planner and developer concerns such as the marketability of developments with less parking, land use changes, and addressing unauthorized parking and maintenance.



Figure 48: Urban Land Institute Shared Parking Methodology¹



¹ ULI, *Shared Parking*, 2005. Page 8.



- **Consider creating a parking enterprise fund.** This fund would generate revenue for parking demand management and operations of existing facilities. The fund would be paid into as an alternative to building parking supply on private parcels. In contrast to in-lieu fees, an enterprise fund would be assured to be reinvested into the transportation system. The enterprise fund would be used to pay for improvements such as parking wayfinding, meter upgrades, data collection, and parking demand management programs and services. In-lieu of fees (which developers pay in lieu of providing the parking spaces required by local zoning ordinance and which are used to finance public parking to replace the parking that would have been provided by the development project) have been considered, but often these funds end up unused because the construction of a new parking structure is either too expensive or parking demand has been lowered by management strategies and the additional parking is unneeded. A parking enterprise fund, which would be paid into on an ongoing basis rather than as a one-time in-lieu of fee at the time of development, would focus on operations and demand management strategies that would improve the efficiency of existing parking resources. Portsmouth, New Hampshire is pursuing such a fund to manage their parking. The parking enterprise fund in Austin, Texas invests in public garage operations, transit, trails, sidewalks, and bike paths. Orlando, Florida's enterprise fund focuses on downtown revitalization, pedestrian projects, and clean, safe, affordable, accessible parking. Newport, Rhode Island uses enterprise fund programs to support its revenue-generating properties such as the harbor facilities, visitor's center, and boat launches. Other cities with parking enterprise funds include Santa Ana, California and Greenville, South Carolina.
- One low-hanging fruit to improve efficiency is to **prioritize specific parkers** such as delivery vehicles, disabled access, loading/unloading zones, 15-minute parking for short errands, and other high turnover uses.

7.2 Organizational Recommendations

Organizationally, one of two situations could be adopted. Either a public-private partnership could be developed to manage parking, or the City of Burlington could assume responsibility for parking as a municipally provided service (such as water, sewer) and eliminate parking regulations altogether, such as Portsmouth, New Hampshire is doing. While the latter option simplifies management in some ways, both City staff and developers have agreed (in meetings for this study) that **the public and private sectors have their strengths and weaknesses and should work together through a public-private partnership (PPP) for an optimal result.** Currently, the lack of a single entity to organize and facilitate transportation and parking demand management programs and strategies prevents Burlington from realizing a more efficient and seamless transportation system.

In Burlington, the PPP would manage parking and provide a single point of contact to **organize and coordinate the multitude of parking facilities and operate the parking supply as one system.** The organization could be an independent authority, a City department, part of an improvement district, or operate under another type of framework. The PPP could be funded by a parking enterprise fund as described above. Among its functions would be:

- **Broker parking arrangements and negotiate shared parking.** The PPP would match potential partners and negotiate sharing arrangements, as well as manage opportunities for remote parking.
- **Provide a home for Transportation Demand Management (TDM) programs.** Previous studies have shown that lack of marketing and/or administrative challenges have prevented commuters from taking advantage of incentives for using alternative transportation or being aware of their options. It is important to keep in mind that TDM **solutions are not all-or-nothing.** Implementing an employee commute reduction program does not mean that employees can never drive into Burlington ever again—even switching to an alternative mode just one day per week would be a 20% reduction in demand. **Flexibility can and should be built into solutions.** For example, providing 3-day/week parking permits (that is, where you can park your car 3 days each week and use alternative transportation the other 2 days) instead of annual permits helps to avoid an “all-you-can-eat” syndrome in which people drive every day just because they can.



TDM programs and services offered by the PPP could include:

- Guaranteed Ride Home Program for employees
 - Carpool/vanpool matching services for employees
 - Employee transit subsidies
 - Incentives for alternative transportation, such as discounts on bicycles or biking gear, parking cash-out, or coupons to Marketplace merchants.
- Parking is hard to find and much of the existing parking supply in Burlington is restricted to private property owners and their clients. The result is underutilized parking: this study and the 2003 Downtown Burlington Parking Study indicate that peak period occupancies do not typically meet the suggested 85% target for maximum efficiency. (Although specific facilities such as the Marketplace garage do reach capacity, there is available capacity at nearby sites such as Town Center, College Street, and Lakeview.) **Parking efficiency needs to be improved through traveler information, wayfinding, marketing, data collection, technology updates, and other management strategies to guide people to the unused parking.** As the manager of daily operations, the PPP would be responsible for this critical part of the parking system. For example, this analysis suggests an opportunity for shifting parking demand to underutilized facilities such as the Lakeview garage (66% occupied), through improved user information (advertising 2-hours free parking in garages, as well as smart signs indicating where available spaces are) and/or pricing (for example, installing parking meters with variable pricing technology to charge more during the peak period for parking adjacent to the Marketplace compared to a block or two away). Improvements to wayfinding (including electronic parking signs) are currently underway by the City of Burlington.

As an example, the City of Charlotte, NC has determined that pursuing a parking wayfinding system will help to unify their fragmented parking system, make parking easier for users, improve efficiency and utilization of existing parking resources, and provide a more cost-effective alternative than building new parking. Their goal is to present the parking system as a single, unified system that appears seamless. This approach is expected to benefit private stakeholders: “Benefits to owners and operators should include higher revenues from increased utilization, the potential for subsidies by the collaborative to expand operating hours (and, ultimately, generate new revenue), and financial and infrastructure support for new technology costs.”¹

- Data collection and **developing/maintaining a parking database** is important to being able to plan and manage the parking supply effectively. The PPP would collect and maintain data to inform how, where, and when parking is used in order to support daily operations and management decisions, and to plan for future use. While this study collected several hours of data to understand parking trends, the collection occurred during the summer when parking patterns are likely different than at other times of the year in Burlington (particularly at the Waterfront). To avoid any bias in planning, a more robust database should be developed. If a parking census is not regularly conducted, utilization (specifically, under-utilization) cannot be assessed to identify efficiency gaps and estimate the need for additional supply.

The types of information that should be maintained in this database includes:

¹ Kimbler, J. “Real-Time Parking Wayfinding System” in the *Institute of Transportation Engineers (ITE) Journal*, December 2010.



Parking Supply Data

- Location
- On- or off-street
- Ownership
- Intended and allowed users
- Regulation
- Price

Parking Demand Data

- Occupancy rates at various times of day, week and year
- Average duration and turnover
- User types
- Violation rates
- Revenue (for priced parking)
- Complaints

Appendix F includes a Data Collection How-To Guide. This database will inform management issues and identify parking problems, including where parking occupancy rates exceed desired levels (typically 85% for short-term, 95% for commuter and residential), difficulty parking delivery and service vehicles, spillover parking (motorists occupying parking spaces intended for other users), and parking pricing that is considered difficult to use or unfair.

- From the database described above (specifically, parking turnover studies), the PPP can **determine parking prices**. This analysis can identify strategies for variable pricing and to encourage turnover as well. Pricing to shift users from highly occupied facilities to under-utilized ones can also be established. For example, prices can be set to shift demand from the Marketplace Garage, which is fully occupied during peak periods, to underutilized facilities such as the College Street and Lakeview Garages. Likewise, parking leases could be moved from the Marketplace to either College or Lakeview. Until more data are available to inform appropriate price levels, a pilot program raising on-street parking prices (with the intention of shifting parkers to underutilized garages) could be pursued.

Parking pricing is similar to regulations, in that it can be used to favor higher value users, but it provides an additional benefit: revenues that can be used to improve transportation services or help finance other municipal programs. However, care is needed to avoid the perception that the city's parking prices are excessive, inconvenient or unfair.

- **Develop strategies and opportunities specific to different user groups and their needs.** For example, short-term parking (such shopping, errands, meals, etc.) should be accommodated downtown (as opposed to remotely). Employees need longer-term parking (8-10 hours), as do some visitors. Employees can be further broken into office (M-F, 9-5) and retail/service (late night, dinner shift, etc.). Office space needs onsite parking to accommodate clients. Parking lease options can be developed accordingly to provide maximum flexibility for users. For example:¹
 - \$50/month for a M-F 8am-5pm lease
 - \$80/month for M-F 24 hours a day
 - \$100/month for 24/7

The PPP would be responsible for studying the various user groups and developing parking strategies accordingly.

- **Use holiday parking management strategies year-round.** The PPP would be in charge of **experimenting with new programs and strategies through pilot programs and trial runs** to determine the effectiveness of and public reception to creative strategies and innovations. For example, the Marketplace Commission is going to implement a trial valet parking program for the 2012 holidays.
- **Develop off-site parking connected to Downtown with a shuttle.** The PPP would manage this remote parking with lower prices than on-site parking (or it could be free) and make sure that it is served by a high-frequency, free shuttle. Implemented with support from TDM programs and enhanced traveler

¹ These lease amounts are only used as an example and are not recommended nor based on existing conditions.



information, a remote facility would accommodate longer-term parking such as residents who do not require their vehicle every day, or employees who park 8-10 hours on weekdays. Balancing this with a guaranteed ride home program, CarShare Vermont memberships and other tools to provide flexibility, as well as incentives such as parking cash out, would help to make this an effective strategy.

7.3 Infrastructure Recommendations

- The first priority put forward by this study is to improve efficiency in the management, operation, and utilization of existing parking facilities; still, the future parking analysis estimates that about 500 additional spaces would be needed by 2040 given the assumed parking requirement adjustments. Therefore, a critical question to be answered is: **If new, additional parking capacity were needed, where, when, and how could it be built?** While the recent CCRPC Park & Ride Plan has identified intercept facilities (Exit 14, South End Transit Center, I-189 & Shelburne Road), other studies¹ have identified potential locations for new parking within the study area. Options that have been identified over the years include:
 - the lot on the southwest corner of Main and St. Paul Street: currently occupied by TD Bank; assumed to have a capacity of 75-90 parking spaces;
 - the “Superblock” on the northeast corner of Main Street and South Winooski Avenue: likely to involve a parking structure; capacity unknown;
 - a parking garage built into the slope on the west side of Battery Street between Cherry and Pearl Streets; the 2009 Waterfront North Access Study estimated an in-slope, automated (necessary for the small footprint available) parking garage to cost approximately \$23M;
 - a garage on the existing surface lot west of Vermont Wine Merchants and northeast of the railyard; assuming 400 spaces and \$15k per space, a structure behind Vermont Wine Merchants could cost roughly \$6M.

Staff agree that the timeline for new structured parking would be at least 5 to 10 years and would likely require a public-private partnership to develop. Design elements to bear in mind during the development of a new parking structure include:

- Attractive design, with special care to insure that parking facilities integrate into the streetscape.
 - Where possible, parking structures should have ground-floor retail, or be wrapped with other types of buildings to avoid blank walls.
 - Design parking facilities to minimize crash risk. Manage access to insure safe driveways.
 - Establish high maintenance standards, particularly for lighting and signage.
- **Build less parking with a contingency plan for occasional overflow.** Many destinations can use off-site parking to serve a portion of their parking demands, particularly during peak periods. For example, a restaurant can arrange for employees to park during evenings at a nearby office building parking lot, and businesses can indicate to customers where they may park when the on-site lot is full, particularly during peak periods such as busy shopping days and special events. Rather than building for the parking peak demand, build for the average demand (or a portion of it) and have a plan in place for addressing overflow when it happens. These arrangements could be facilitated by a PPP.
 - The Burlington Department of Public Works will be upgrading parking meters in specific locations. These improvements will enable parking meters to accept credit cards as well as cash/coins; allow customers to pay by cell phone; transmit transaction, enforcement, and operational data wirelessly; and allow the DPW to program variable pricing. Each meter will serve multiple spaces and will be pay & display or pay-by-space. **Implementing updated parking management, data collection and enforcement technologies will be critical to maintaining the integrity of the parking supply.**

¹ Waterfront North (2009) and Waterfront South (2010) Access Studies.



- **Implement Complete Streets as described in the Burlington Transportation Plan.** The actual extent to which all of the elements contained in the design guidelines can be applied to individual corridors will need to be evaluated on a case-by-case basis to best determine how to accommodate all modes while maintaining efficient circulation. The design guidelines and the Side Streets designs provide a palette of elements that should be consistently utilized throughout the study area for continuity.
- **Improve streetscaping between Downtown and the Waterfront to attract pedestrians, connect these areas, and encourage people to “park once.”** Extend the Marketplace improvements that are being applied to lower Church St. and St. Paul to east-west blocks. Implementation of the Complete Streets described in the Burlington Transportation Plan will improve streetscapes.
- Pursue the recommendations of the *Waterfront South Access Study*, which identifies various forms of a new grid street network to increase frontage and property access, remove truck traffic from neighborhoods, facilitate multimodal movements, and develop economic potential while accommodating the railyard.
- Continue to pursue the recommendations of the *Waterfront North Access Project*:
 - Re-alignment of northern Lake Street and the bike path, including pedestrian amenities, stormwater improvements, undergrounding of utilities, street lighting, landscaping, and parking, which will support adjacent development opportunities.
 - Continued investigation of improvements to Depot Street to make it a bicycle/pedestrian only route and development of a stairway extending from Sherman Street to the Waterfront. These improvements will address public safety; enhance waterfront access from the Old North End, and upgrade stormwater, utilities and street lighting.
 - Other concepts identified in the 2009 scoping study such as north-south transit along the Waterfront, in-slope parking, and funicular require additional study. With respect to the parking and funicular, the City should pursue partnerships with private property owners.
- The Department of Public Works is responsible for the maintenance and operation of public parking. Improvements that were suggested during the course of this study are:
 - **Re-evaluating on-street No Parking zones.** There are some spaces that are designated ‘No Parking,’ but the original reasoning for this assignment is no longer applicable and parking could be reclaimed.
 - **Ensuring that on-street parking does not interfere with driveway sight distances.** There are locations where parked cars adjacent to driveways or accesses block visibility and create a hazardous situation.
 - **Enhancing the attractiveness of parking garages.** Stakeholder input has suggested improving lighting, customer service, stairway cleanliness, and wayfinding/traveler information when the Marketplace garage is full. Adding signage in French to alert users to the low vertical clearance would also be an improvement.
- Projects that have been identified by other plans would support alternative modes that would make them more attractive and encourage a mode shift. Among these are:
 - Developing a Multimodal Transportation Center in Burlington.
 - Reforming transit funding.
 - Expanding transit system convenience, particularly by increasing service hours and frequencies on the major corridors that serve the City: North Ave, Colchester Ave/Pearl Street (VT 15), Williston Road/Main Street (US 2), and Shelburne Road (US 7). Model improvements after the College Street Shuttle, which is frequently commended for its high-frequency, convenient, user-friendly, and easy to understand service.
 - Improving transit service between Burlington, South Burlington, and Winooski.
 - Developing a bicycle connection to Winooski.



- Creating pedestrian alignments from Battery Street to the Waterfront, extending from Sherman Street, Battery Park, Pearl Street, midblock between Pearl and Cherry, and Cherry Street.

